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RAY & REAM a subsidiary of Fray Machine Tool Co., Inc. 503 West Windsor Road, Glendale, Calif.



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The headstock of this Sparks Hydra-Feed Standard Lathe, manufactured by the Sparks Machine Tool Corporation of Norwalk, Conn., is equipped with a "LOGAN" Model "HR" Hydraulic Cylinder for the actuation of a "LOGAN" Expanding Mandrel. "LCGAN" Model "HR" double acting, rotating type Hydraulic Cylinders are designed for efficient operation of chucks, mandrels and other work holding devices required The many exclusive features of the "LOGAN" Rotating Type Hydraulic Cylinders assure continuous service without maintenance expense. A "LOGAN" 3-Jaw Expanding Mandrel holds the work securely in place during the work operation. This "LOGAN" Hydraulic Equipment provides rapid, positive action and rigid support of the work. Let "LOGAN" Representatives and "LOGAN" Engineers make recommendations on your air and hydraulic problems.

MANUFACTURERS OF ARE
AND HYDRAULIC DEVICES
CHUCKS, CYLINDERS, VALVES
PRESSES AND ACCESSORIES

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# Mochine Shop Volume 15 . Number 10 MARCH, 1943 Contents

HOWARD CAMPBELL, Editor

Servel Converts for War Production

Published monthly by SARDNER PUBLICATIONS, Inc. 81 Main St., Cincinnati, Ohio

DON G. GARDNER
President and General Manager

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## RONG





#### This WAR is being won with High Speed Steel in ARMSTRONG TOOL HOLDERS

Victory begins in the tool rooms and machine shops, for striking power first takes form in jigs, fixtures and dies . . . in more and more machine tools, each operating continuously at the highest possible speeds and feeds.

Since the capacity of any machine tool is limited to the efficiency and capacity of its cutting point, we can afford, today, only the strongest and most efficient cutting tools with the finest cutting edge. This means, for all general lathes, planers, slotters and shapers and for many screw machine and turret lathes, the correct ARMSTRONG TOOL HOLDER with a cutter bit of high speed steel.

With high speed steel so essential to top effi-

ciency, so widely needed and with our naise supply so difficult to maintain, to waste is speed steel in forged tools is to delay via speed steel in forged tools is to delay visible cause the same high speed steel consuments on the consumer of rooms.

#### ARMSTRONG BROS. TOOL CO.



"The Tool Holder People"
328 N. FRANCISCO AVE., CHICAGO, U. S. A. Eastern Warehouse and Sales: 199 Lafayette St., New York



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# Medine Shop

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Vol. 15, No. 10

CINCINNATI, OHIO

#### We Present ---

as the feature article in this month's issue — a story of the activities involved in conversion of a modern peacetime manufacturing plant to an arsenal for the production of war materials. Under the title "Servel Converts for War Production" the author lains the steps that were necessary and takes the reader through a maze of conferts, tool designing, layout replanning, dismantling and setting up, and so on. The cy of this plant is, however, fairly representative of the changes that have been nught in American industries in the past year and one-half. On page 108.

on page 124—a safety article which presents some ideas that will be easily adapted certain types of manufacturing plants. The author—Alfred M. Cooper—is a well-wn safety engineer and his methods have been successful.

on page 144—the second of Noel Brindle's series of articles "Tooling for the Autotic Screw Machine." In this article Mr. Brindle presents several planning layouts and
we how the planner gets the maximum production out of his machine. To everyone
o is connected with screw machine tooling, planning or operation we again give this
of advice—"Save the issues in which these articles appear. Back numbers may not
available at later dates."

-for those who are interested in plating methods—an article on page 156 under the "Induction Heating Speeds Tin Plating Process" in which the author tells how stinghouse is using induction heating to obtain a fine tin plate while using a minimum in. Induction heating is fast coming into its own as an efficient, economical method applying heat for industrial purposes.

on page 168—the first release of a "Plant Protection Fact Sheet" from the U. S. NG To fice of Civilian Defense presenting an outline for organizing the plant personnel far, we protection against air raids, sabotage, and so on. This subject is important to every jigs. I am manager and the material presented here is thorough and practical.

on page 182—a short article by an engineer of the Carboloy Company explaining dillustrating the proper method of salvaging worn out tools by the application of mented carbide tips. Under present day conditions any practical suggestions for savetols becomes important.

the usual interesting "kinks" in the departments "Ideas from Readers" and "Modern wipment at Work." Whiteford's cartoon on page 372 will strike a responsive chord.

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### Modern Nachine Shop



TOOL & REAMER CO.
a subsidiary of Fray Machine Tool Co., Inc.
503 West Windsor Road, Glendale, Calif.





The headstock of this Sparks Hydra-Feed Standard Lathe, manufactured by the Sparks Machine Tool Corporation of Norwalk, Conn., is equipped with a "LOGAN" Model "HR" Hydraulic Cylinder for the actuation of a "LOGAN" Expanding Mandrel. "LCGAN" Model "HR" double acting, rotating type Hydraulic Cylinders are designed for efficient operation of chucks, mandrels and other work holding devices required The many exclusive features of the "LOGAN" Rotating Type Hydraulic Cylinders assure continuous service without maintenance expense. A "LOGAN" 3-Jaw Expanding Mandrel holds the work securely in place during the work operation. This "LOGAN" Hydraulic Equipment provides rapid, positive action and rigid support of the work. Let "LOGAN" Representatives and "LOGAN" Engineers make recommendations on your air and hydraulic problems.

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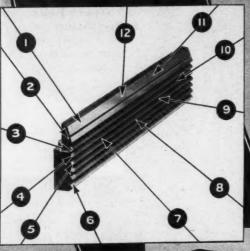
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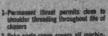
### Acclaimed.. The Finest Thread Cutting Tool in Industry



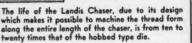
The LANDIS

Used Exclusively in LANDIS Die Heads and Threading Machines

WHOD







The cutting edge is renewed completely at each re-grinding thereby maintaining the original accuracy of the chaser. The throat is not altered by regrinding and therefore permits close-to-shoulder thread-ing throughout the life of the chaser

Landis Chasers are interchangeable—any one of a set may be replaced.

Waynesboro, Pa.

MODERN MACHINE SHOP

March, 1943

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March,

# TO GET MAXIMUM TOOL LIFE PLUS PRODUCTION -- ACCURACY -- FINISH FROM YOUR BORE-MATIC TOOLS





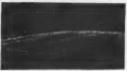
Your single point carbide tools can be quickly lapped exactly to required apacifications on the Heald Tool Sharpener — make a few simple adjustments, flick a switch and your tool is correctly lapped, automatically.



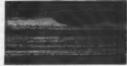


The personal element is bound to be reflected in tools ground free hand. Exect tool shapes are impossible to produce. Undesirable irregularities in the cutting edge cannot be avaided.

Free hand grinding of single-point cemented carbide tools will cut short tool life - and lower production, too. By correctly lapping carbide tools on the Heald Tool Sharpener tool life can be greatly increased since a lapped edge is keener, cuts longer, doesn't break down as fast as a ground edge . . . valuable tool material is conserved because more pieces are produced per sharpening, less material is lost in sharpening . . . better accuracy and finish are obtained as a result of the lapped edge cutting more smoothly, holding its contour longer . . . production is boosted because time lost in resharpening and replacing tools is measurably reduced. Such results cannot be obtained by grinding tools free hand - they must be mechanically lapped on a diamond wheel. Only by positively controlled diamond lapping can absolute regularity of cutting edge and exact nose radii, rake, shear and clearance angles be consistently reproduced. The Heald Tool Sharpener is designed to sharpen tools this way - quickly and inexpensively. Complete details gladly sent on request.



Photomicrograph of tool point lapped with fine grit diamond wheel on Heald Teel Sharpaner. Abgailfization 100X. Note the absolute regularity of cutting edge. This means longer tool life, better finish and accuracy, increased preduction.



Phetomicrograph of tool point ground free hand with fine abrazive wheel. Magalitication 100X. Irregularities in cutting odge result in localized stress concentration, then breakdown of the cutting edge and rapid

THE HEALD MACHINE CO. WASS COSTER

43

### Incredible Uncle Ishmael

... the one-man army!



UNCLE ISH is the derndest feller. He paid 4½ cents for that weapon, and he can shoot a clay pipe right out of your mouth at 100 yards. What's more, he's a one-man army. . . . Incredible? Well, here are the facts:

The famous Robbins & Lawrence and E. G. Lamson companies, ancestors of Jones & Lamson, had working for them in the 1800's two of the finest guasmiths in the world. They were Albert Ball and Benjamin Tyler Henry, and the genius of these two men contributed much to the invention of a gun that was destined to make history.

That gun is known throughout the world today as the famous Winchester rifle — but in an earlier form, as the Ball lever-action repeater, it was known only as a headache to E. G. Lamson & Co. For there was a large order from the government for this revolutionary firearm, to replace the muzzle-loaders being used in the Civil War, but the war ended before delivery could be made.

The result: Hundreds of these repeating rifles were put up for sale at one-half cent a pound—and Uncle Ishmael got one. Nine pounds of the greatest gun in the world, for 4½ cents!

Later, when the patent for Ball's lever-action magazine was purchased and combined with improvements in rifle design made by Henry and another gunsmith named King, the great Winchester rifle was born. And it was an early advertisement for this rifle that told how Uncle Ishmael was a one-man army. "A man armed with one of these rifles," it read, "can load and discharge one shot every second, so that he is equal to a company every minute, a regiment every ten minutes, a brigade every half-hour, and a division every hour!"

The company in which that famous firearm had its origin is known today as Jones & Lamson, and the gun is typical of many great American products that have stemmed from the tools — and the men — developed by this company.

Jones & Lamson engineers and service men are at your call today...right now...to help you in solving the difficult problems of present and post-war read-

### **JONES & LAMSON**

Machine Company SPRINGFIELD, VERMONT, U. S. A. Profit-producing Machine Tools

Manufacturers of Rom & Saddle Type Universal Terret Lethes . . . Fay Autometic Lethes . . . Automotic Thread Grinding Mothines . . . Comporetors . . . Automotic Opening Threading Dies and Obseas.



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### THE GEAR WITH A Backbone

The distinctive feature of Farrel-Sykes Herringbone Gears is the continuous teeth with sharp apices, which give them the "backbone" to meet today's need for unfailing service under all conditions of operation... not only on the production line of industry, but in the ships, tanks and planes at the battlefront.

Their greater effective face width gives them the extra strength and high load-carrying capacity in small space. The combined characteristics of overlap or interlacing of the teeth, gradual engagement and inclined line of pressure, contribute to smooth, quiet operation and maintenance of correct tooth action throughout the life of the gears.

Farrel-Sykes gears and gear units are made for every type of service and an experienced engineering staff is available for consultation on gear problems.

#### FARREL - BIRMINGHAM COMPANY, INC.

381 VULCAN ST. . . . . BUFFALO, N. Y.

Plants: Ansonia and Derby, Conn.; Buffalo, N. Y.



Wear-resistance in gages can provide the means to save critical materials—used both in the manufacture of the gages themselves and in parts which require extremely accurate inspection.

New gages supplied in hard chrome plate or Carboloy cemented-carbide have much greater life than those made of steel. It is obvious that, by their use, in high production gaging, the amount of steel required for ordinary gages—in quantities which will provide proportionate inspection useful-ness—can be used for other purposes. In salvaging worn steel gages by chrome plating, no new steel is required and the life of the gage is increased to approximately five times its original period of service.

Of equal importance, is the increased manufacturing tolerances made possible by the use of wear-resistant gages. Chrome plated and Carboloy gages produced by Lincoln Park can be specified extremely close to required limits. Allowance for wear can be reduced considerably, automatically adding to manufacturing tolerances. This slight extra percentage of tolerance is especially important when parts being inspected are very close to required limits. It eliminates rejections of parts that should be accepted which, in many cases, results in great savings in expensive parts—and the critical materials used in them—and in man and machine hours.

MARD CHROME PLATE—Provides appreximately five times the wear-resistance of steel. Lincoln Park—with complete, medorn facilities for preparation, plating and finishing—supplies now chrome plated gages and also salvages wern steel gages by plating. A new service is also affered in the salvaging by hard chrome plating of wern surface plates.

CARBOLOY—Provides more than fifty times, the wear-resistence of ordinary gages. Lincoln Park pioneered the use of these comented-carbides in gage manufacture, and for a number of years has been the largest user of Carboloy in the gage industry. A wide variety of gages and non-cutting precision tools of this meterial are new produced in the Lincoln Park plant,

LINCOLN PARK TOOL and GAGE CO.

19

50

# PREVENT CASUALTIES in Your Screw Driving Army



#### PHILLIPS SCREWS END DRIVER-SKIDS!

"Speed up, and do it safely!" That's 1943's war production challenge. This year we can't afford another sacrifice of 500 million worker days to preventable shop accidents... like injuries from skidding screw drivers.

Safety measure No. 1 for screw driving operations is accomplished when you specify screws with the Phillips Recessed Head. The driver can't slip out of the recess to slash a worker, or damage the work!

Relieved of fear, workers naturally step up speed. And, the automatic centering of driving force in the scientifically designed Phillips Recess eliminates many other handicaps to speed: the fumbling, wobbly starts...re-driving of slant-driven screws...removal of broken-head screws...reclaiming of marred parts. Fast, faultless, safe driving becomes automatic, even for "green hands." Power driving becomes practical.

They cost loss to usel Compare the cost of driving Phillips and slotted head screws. You'll find that the price of screws is a minor item in your total fastening expense... that it actually costs less to have the many advantages of the Phillips Recess!

#### KEY TO FASTENING SPEED AND ECONOMY

The Phillips Recessed Head was scientifically engineered to

Fast Starting—Driver point auto motically centers in the receas . . . 60 augity. Screw and driver "become one unit." Fumbling, wobbly start are diminated.

Paster Driving—Spiral and power driving are made practical. Drives won't slip out of recess to injurworkers or spoil material. (Average time swing is 30%.)

Easter Driving—Turning power is inity utilized by automatic centering of driver in screw head. Workers maintain eneed without tiring.

Better Fastenings—Screws are set-up uniformly tight, without buring or breaking heads. A stronger,



### PHILLIPS Recessed SCREWS

WOOD SCREWS . MACHINE SCREWS . SELF-TAPPING SCREWS . STOVE BOLTS



American Serve Sa., Providence, R. I. Pha Astrict De., Weterberg, Sono. Sentral Serve So., Shicaga, III. Shandhe Products Serp., Slevelond, O Bouthnestal Serve So., Rew Bodford, M De Barble Sonon Gara, San Astriala, E

tolarasticad Garaw Co., Batrott, Mich. The Latiness & Sapatens Co., Elevaland, Obie The Halload Saraw & Mig. Co., Clavelaye, Gold Row England Saraw Co., Cones, H. H. The Chartes Parker, Es., Mariden, Goos. Phosif Manufacturing Co., Sisiongo, M. Randing Darwer Co., Morthitews, Fa. -Massell Burgest & Ware Goll, & And Go., Port Sheator, G. Y. Gorelli Manufacturing Co., Water Mile, Guiss, Makeproof Inc., Chikaga, M.

### POINTERS

ON KEEPING YOUR CINCINNATION ON KEEPING YOUR CINCINNATION OF THE PLAN OF THE PROPERTY OF THE P





CINCINNATI 10" Plain Hydraulic Grinding Machine. Advantages and engineering specifications fully covered in catalog G-490. Copies available at no obligation whatever.



Remove collet at least once a month and clean drain hole and slinger grooves.



Check level of machine periodically, and relevel if necessary. How often depends upon type of foundation. Check after first month of operation. eff Gr

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CHINES ...

SIMPLE, easy-to-follow routine and common-sense precautions will do much to keep your machine tools running longer...more efficiently. Here are a few pointers for CINCINNATI 10" Plain Hydraulic Grinding Machines:

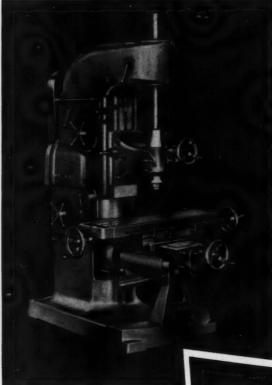
- Lubricate your machine daily, using oil of the recommended specifications.
   Change oil as recommended; oftener if shop is dusty or if machine is operating three shifts. Lubrication schedule tag tied to machine will help.
- 2. Change replaceable filters and clean spindle oil filter when changing oil. New filters are cheap insurance against machine breakdown.
- Accurate work tolerances require periodic releveling of the machine. Foundations are rarely stable enough to maintain the accuracy of initial leveling.
- 4. High grade finishes require clean coolant. Remove sludge from coolant reservoir once or twice a week.
- 5. When changing wheels, remove collet and clean out drain hole. This simple precaution will keep coolant out of spindle oil.
- Use handwheel retraction of footstock center for heavy work and when removing stock rapidly. Don't take a chance on work jumping out of machine.



Follow printed instructions in lubricating your machine. An oil schedule tied to the machine will help, and a central lubricaion department will do a better job.



Item No. 1 — the most important factor of longevity and high efficiency in machine tools—is fully covered by our lubrication booklet, No. M-1084-2. Copies available on request.



KNIGHT MILLERS produce

Even Difficult Set-Ups Made in a Short Time With This Machine!



Milling and boring a template four inches longer than the table travel.

These milling machines will perform and produce, at any of their speeds and feeds, to the full capacity of the motor installed, and the capacity of each machine is only limited by power output of the motor recommended. There are 16 changes of speed in either direction, 4 vertical spindle feed changes and 16 table feeds in either direction.

Write Today For Our Catalog

W.B. KNIGHT MACHINERY CO. MISSOURI

ST. LOUIS

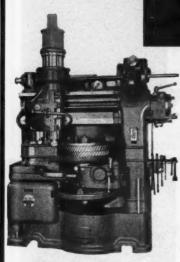


The Shop with a Gear Shaper can Cut

More than Gears

CUTTER

The Gear Shaper is "first choice" for the cutting of cams, splines, irregular and interrupted contours. The precision inherent in the Fellows-ground Gear Shaper Cutter, guarantees precision duplication of a given part at low cost. For details, write for our book of variety work "The Practical Art of Generating".



6A-Type Gear Shaper

943

THE FELLOWS GEAR SHAPER

To Finish The Job Quicker ...



### SOLVE LABOR

PLACING THESE









12

March

### SHORTAGE PROBLEMS BY

### TOGETHER LIKE THIS

Is your production suffering because of a labor shortage? In many plants this problem simply must be overcome in order that the upward swing in production can be continued.



Tike other problems facing American industry this one will be licked. Here is one way to do it --

Enlist the aid of the thousands of American women who are eager to serve their country as production soldiers. Put them to work in your plant—together they will form a battalion that will release great numbers of skilled male workers for other more strenuous jobs. As for their ability to operate machines, well, here is the actual experience of a well-known manufacturer of chucks.

He is grinding chuck jaws on Zandis 4" Jype H. Plain Hydraulic Gninders operated by companatively inexperienced female employees. He seports as follows: "Since the installation of these Tandis machines, production has increased 35%, a power saving of 30% has been effected and wheel life has been greatly extended. Maintenance records have been new low."

Perhaps, if you hape a labor shortage problem, it can be solved in a similar manner. But remember—for best results choose grinding machines that are seasy to set up and operate, and that can be used continuously without the need for time-consuming readjustment and repair. Or, more specifically, for best results choose Landis Grinders.

Unusual Performance

Qs. Usual



### LANDIS TOOL CO. WAYNESBORO, PENNSYLVANIA



MICROSPHERE WHEEL SPINDLE BEARINGS



CYCLE CONTROL LEVER



VARIABLE VOLTAGE HEADSTOCK

395

### BUILT IN SIX

from 3 foot up to



IT'S EASY TO SELECT THE CORRECT SPEED FOR VARIOUS METALS

### ECONOMAX Hydraulic RADIALS

The ADAMSON MACHINE CO. of Akron, Ohio, appreciates Fosdick Versatility

The two Fosdick Radials illustrated show the wide range of work that may be handled economically on these versatile machines.

these versatile machines.

Thirty-six spindle speeds — eighteen feeds compactly built into the head provide for a wide range of operating requirements. The levers for accomplishing the various speed and feed changes are also centralized in the head for

operator's convenience. Hence—
you have the added advantage
of quick change-over from one
job to another due to the wide
operating range and broad selection of feeds and speeds instantly
available.

available.

If it's a Radial job it's a Fosdick job. Write for bulletin MSR, or consult a Fosdick representativel

HOSDICK

MACHINE TOOL COMPANY

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Wheel Dressing

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HAMUND COMPANY - NEW YORK

INVESTMENT BIRKOVER AND ELANGED PROPERTY



PERIODIC LUBRICATION PROPER ALIGNMENT BIG FACTORS IN IMPACT WRENCH PERFORMANCE

# 4 Simple Maintenance F steps keep Preumātic Wrenches on the job

Because of their sturdy construction, slow motor speed and fewer parts (no springs or gears). CP Pneumatic Wrenches (impact type) give long service under severe conditions with a minimum of repairs. But, they will give even better service if they are given a little precautionary care.

Here are four simple maintenance steps for your CP 365-R Pneumatic Wrenches. Do these things reqularly and you will keep your wrenches on the job, cut repair time to the minimum and conserve strategic materials. Suggestions for the care of other sizes of CP Pneumatic Wrenches (impact type) will follow shortly.



Center S

Autometi

Milwauke

Machines, Accessories and Attachments for a wide Variety of Needs:



Rotary Head Milling



Autometric Jig Boring Machine



Milwaukee Midgetmill



Milwaukee Speedmill



Milwaukee Face Mill Grinder



Center Scope

### THE MILWAUKEE FACE MILL GRINDER GIVES YOU ALL THREE!

- 1 UNUSUAL RIGIDITY
- 2 REDUCED SHARPENING TIME
- ACCURACY TO WITHIN .0002



THE basic design of the Milwaukee Face Mill Grinder embodies strength, precision, and capacity. It is capable of sharpening Tungsten Carbide Cutters ranging from 3" to 16" in diameter — grinds the blades to within .002. Set-ups are quickly made with graduated dials, facilitating adjustments. Other controls are handily located for simplified operation.

#### OTHER IMPORTANT FEATURES:

- 1. Jeweled bearing dial indicator for accurate checking.
- 2. Finger tip control.
- 3. Fine thread precision saddle screw.
- 4. Hand screw permits angular
- setting of 15° on either side.
- 5. No adapters necessary.
- 6. Spindle has No. 50 National Standard Taper.
- 7. Blower system at slight extra cost.

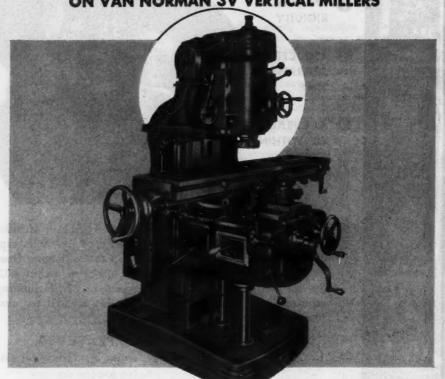
For complete information write for Bulletin No. 41A

Buy Victory with at least 10% in War Bonds!

HOPFICE OFFICE OF CENTRAL PRODUCTION

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# Adjustable Ram and Spindle Assembly Increases Your Work Range ON VAN NORMAN 3V VERTICAL MILLERS



Noteworthy of the many important features incorporated in the Van Norman 3V Miller is the adjustable vertical spindle, mounted on a sliding ram. This sliding ram permits the throat distance to be varied so that the spindle can be more closely coupled to the column... which means maximum rigidity that insures greater accuracy. The variable throat distance also increases the range of set-ups and work that can be handled on this machine. In addition, the front and rear directional controls of power feeds, rapid traverse for table, knee and saddle provide ease of operation.

### Van Norman Milling Machines

VAN NORMAN MACHINE TOOL CO., SPRINGFIELD, MASS.

MODERN MACHINE SHOP

March, 1943

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March, 1

18



### 6"BAR HORIZONTAL BORING and FACING MACHINE

with Micro-Feed Unit

READILY adaptable to many current production problems, this 6" Bar Horizontal Cylinder Boring and Facing machine is available for immediate delivery. Inspection is invited, and we will be glad to discuss its application to your work.

The bed, of massive construction, is heavily ribbed to insure maintained alignment. Standard length of the boring bar, made of turned and ground high-carbon steel, is 17', but lengths up to 24' can be provided.

By means of Simmons Micro-Feed Unit, an infinitely variable transmis-

sion, this boring machine offers both fine and coarse feeds ranging from .004" to 1.000" per revolution of spindle. Main drive to the boring bar is obtained through a motor driven, six-speed gear box. Gears are of high-carbon steel and mounted on spline shafts with anti-friction bearings running in oil. Power Rapid Traverse is supplied to the bar in both directions.

#### SPECIFICATIONS

Write TODAY for descriptive bulletin.

#### SIMMONS MACHINE TOOL CORPORATION

1745 NORTH BROADWAY,

ALBANY, N. Y.





Along the production lines and in the repair shops on the front line, you will find Clark portable drills and electric tools.

Ever since Jas. Clark produced the first portable drill in 1898, Clark's many innovations and improvements have made their drills leader in the field, both in years of service and in economical operation.

"for the home front . for the battle front"



JAS. CLARK, JR. ELECTRIC CO.

606 BERGMAN ST., LOUISVILLE, KY.

Help win

TEXA

TH mile with other to

than

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with

Texa

\* Mi

than



## Output Guadrupled

### between tool grinds

#### THEY PREFER TEXACO

★ More revenue airline miles in the U. S. are flown with Texaco than with any other brand.

★ More buses, more bus lines and more bus-miles are lubricated with Texaco than with any other brand.

\* More stationary Diesel horsepower in the U. S. is lubricated with Texaco than with any other brand.

★ More Diesel horsepower on streamlined trains in the U. S. is lubricated with Texaco than with all other brands combined.

\* More locomotives and railroad cars in the U. S. are lubricated with Texaco than with any other brand. WHEN MACHINING 37-mm high-explosive projectiles, involving drills, reamers, taps and form-tools, 50 to 150 pieces was top output between tool grinds.

Then the cutting coolant was changed, and output not only was quadrupled but feeds were also increased. The cutting coolant that permitted this tremendous increase is Texaco Transultex Cutting Oil BB.

Texaco Transultex is transparent, permits operator to see what's going on; it permits freer cutting, carries away more heat, produces better finish.

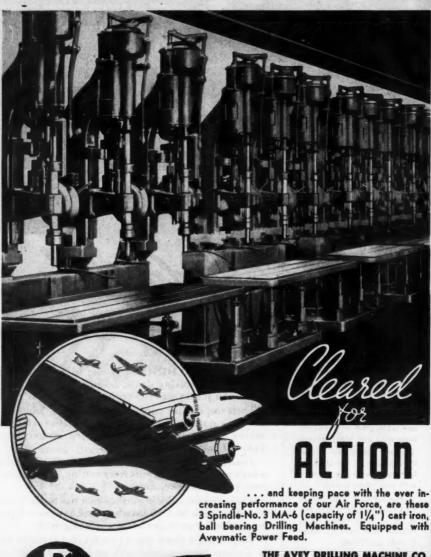
The outstanding performance that has made Texaco preferred in the fields listed in the panel has made it preferred by prominent users in the metal-cutting field.

Texaco users enjoy many benefits that can also be yours. A Texaco Engineer specializing in cutting coolants will gladly cooperate in the selection of the most suitable products for your operations. Just phone the nearest of more than 2300 Texaco distributing points in the 48 States, or write The Texas Company, 135 E. 42nd St., New York, N.Y.

Help win the war by returning empty drums promptly ★ Tune in FRED ALLEN every Sunday night — CBS



TEXACO Cutting and Soluble Oils





MODERN MACHINE SHOP

March, 1943

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Model " cam-ope ing the principl rigid to cludes within for norr cuts, 5" 46" bet This me flexibilit clutches a very set it ca are anti is adeq are of h resisting Ease of the bu MECHA stroke n

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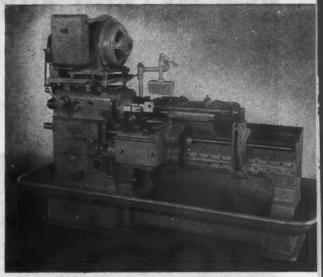
### So-swing MODEL LR LATHE

# For Economy and Consistent Accuracy on Volume Production or on Short and Medium Runs

Model "LR" is a fully automatic, cam-operated lathe, incorporating the time-tested Lo-swing principle of sufficient mass and rigid tool support. Its field includes practically any work within its capacity—2" diam.

for normal stock removal, 4" diam, for light cuts, 5" diam, for flanged work — and up to 46" between centers in the longest bed length. This machine, while aftering the utmost in flexibility, is 100% mechanical without any clutches in the feed train. Not only is the "LR" a very simple machine to service, but once set it cannot get out of time. All rotating shafts are anti-friction bearing equipped. Lubrication is adequate and automatic. Carriage ways are of hardened steel to provide greater wear resisting qualities.

Ease of set-up and operation are provided by the built-in Seneca Falls CHANGE-OVER MECHANISM by which length of carriage stroke may be quickly varied; CONVENIENT LEVERS for throwing in and out the feed and



rapid traverse (normally automatic) manually, and by the LOW CENTER HEIGHT (37") which allows the operator to examine and adjust all tools from the operating position. Low center height also contributes to ease of loading.

Model "IR" Lo-swing is designed to provide maximum efficiency with carbide tools. It is a versatile lathe in that it may be equipped with either direct V belt drive to the spindle for high speed, fine finishing cuts, or a geared drive with pickoff gears for slower roughing cuts. The Model "IR" Lo-swing may also be equipped with a Third Slide (overhead) as well as additional back-squaring attachments, carriages and carriage slides, making for innumerable tooling possibilities.

### SENECA FALLS Automatic WORK DRIVER Self Centering...Quick Acting...No Slip. Attaches to any chuck plate

Self Centering... Quick Acting... No Slip. Attaches to any chuck plate or spindle. Provides a positive, balanced drive which reduces chatter. Handles rough forgings or turned pieces—straight or taper. Eliminates dogging time. Reduces tool breakage. Write for details and size range.

SENECA FALLS MACHINE CO. SENECA

# NEW METHOD FOR LAPPING CARTRIDGE DIES

with
Reciprocating
Tool



A new and perfected method of lapping cartridge dies has been developed. This is accomplished by the use of a diamond wheel, mounted on a spindle which is held in the chuck of our reciprocating tool. The tool is then mounted in a cradie which sets on the bed of the machine. By threwing the switch on, the reciprocating tool will then give approximately 1,200 to 1,400 strokes perminute. This reciprocating action, combined with the retating motion of the die, which is held in the chuck of the machine, gives the desired lapping eperation. In addition to the reciprocating action of the tool itself, an oscillating motion is also obtained when the tool moves on the bed in a forward and backward motion.

A typical setup for the fine finishing of dies is shown herewith. A 500 grit Norton diamond resincid wheel is used. This wheel does not revolve, and is applied in the same manner as a honing stick with light pressure.

The device operating the wheel is our Portable Electric Honing Tool which gives the reciprocating action, and has a  $\frac{1}{8}''$  stroke.

By this finishing method, plants have been able to abtain surface finishes better than 3 microinches R.M.S., in a matter of a few minutes. It is the combination of the rotating and reciprocating motions that gives this fine finish in such quick time.

FOR ADDITIONAL INFORMATION WRITE . . .

### ACME TOOL COMPANY 200 CHURCH ST. NEW YORK, N. Y.

MODERN MACHINE SHOP

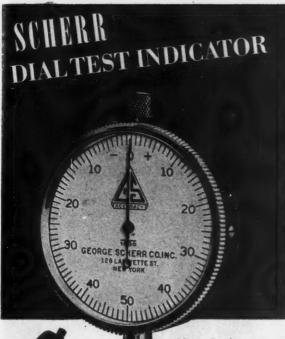
March, 1943

Availal having mits w setting any po SPECIF of hours. Plunger

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Write Scherr

March.



Simple in construction-**Durable** and Guaranteed for Accuracy...

Available with universal back having ball joint which per-mits wide range of indicator settings. Can be clamped in

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43

settings. Can be cramped in any position.

SPECIFICATIONS — Diameter of housing—2". Thickness—1"s". Stem diameter—275". Plunger travel — 1"s". Dial graduated in 1/1000"—0-50-0.

This improved instrument, developed by specialists in precision measuring, offers unique features which assure greater accuracy, minimize friction and reduce the chance of error. Simple in construction, with but three moving parts, the GS Dial Test Indicator can be depended on for long service and maintained accuracy. Features include:

... rotating adjustable dial for zero setting with positive lock nut.
... case and plunger housing machined in one piece from nickel silver casting.

... movement mounted between separate top and bottom plate.
... dustproof case and rustproof mechanism.
.. non-breakable crystal. Set with Attachments, \$18.00.

Write for illustrated bulletin giving detailed information on the Scherr Dial Test Indicator. Write, wire or telephone (Canal 6-3512) for quotations and delivery dates.



REED MICROMETERS assure accuracy over full range of screw. Easy to read, smooth and sensitive. 901 Tenths \$10.25 List.



MACHINISTS' TOOLS—available in a wide range of types for all kinds of precision measuring.



TOOL CHESTS - lightweight, strong and durable; separate locks for open top and drawer sections. #720 Oak \$13.50 Net.



Grinding Room Specialties
MAGNE-BLOX laminated magnetic parallels and V blocks for holding work that cannot be placed directly on magnetic chuck. \$14.50.

"LITTLE WON-DER" RADIUS DRESSER—makes possible fast and accurate dressing

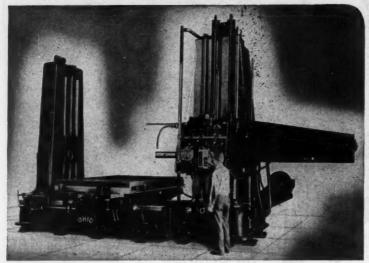
of convex or con-

cave wheels from 0 to 1" without removing wheel guard. \$46.00.

GEORGE SCHERR COMPANY, INC. 130 LAFA YETTE ST. NEW YORK, N. Y



Order now and insure reasonably prompt delivery.



Output has no meaning apart from excellence of product. Features built into Ohio Horizontal Boring, Drilling and Milling Machines now stand in good stead as war production demands increases in both quantity and quality. Examples: nitrided spindle, narrow guides, internal gear-tooth type clutches, unit construction, push-button control, anti-friction bearings, built-in

rapid traverse to spindle and all other parts, continuous spindle feed of 72" with full-length spindle support. Table type extra heavy duty model shown. Also floor type in extra heavy duty model; table and floor types in heavy duty model. Get Bulletin 300 or 310. Reasonably prompt deliveries can now be made on these machines.

THE OHIO MACHINE TOOL COMPANY, KENTON, OHIO



James Billing

behin typica

father

battle

March

# MEN of BILLINGS



23 YEARS of CONTINUOUS SERVICE

James "Jim" Fagan — master forger at a Billings Hammer producing for "the men behind the men, behind the guns." Jim is typical of many Billings craftsmen, both fathers and sons, doing their utmost in the battle of production. Meet Jim Fagan, one of the Billings master forgers. Jim, like many other "Men of Billings" knows forgings. To him, one of his forgings is more than a piece of hot steel. It is the product, the end product, of a craftsmanship acquired during the 23 forging years of this skilled "hammer-man" — one of the "Men of Billings."

BILLINGS
always have been good
FORGED TOOLS AND AIRCRAFT FORGINGS





Yes, Jim buys WAR BONDS— "it's my duty," says Jim.

FORGED Silings TOOLS



GRADE V: For heavy roughing on all types of high tensile strength materials (1/32" to 1/8" feed)

Rockwell "C" hardness 61-64

GRADE X: For medium roughing and semi-finish on all high tensile strength materials (.010" to .032" feed)

Rockwell "C" hardness 65-67

GRADE XV:

For finishing cuts on all types of materials. Also roughing and semi-finish on low tensile strength materials such as bakelite, brass, bronze, aluminum, copper, etc.

Rockwell "C" hardness 68-70

#### RECOMMENDED SPEED INCREASES OVER HIGH SPEED STEEL:

Low tensile strength materials	to 300%
Cast iron and semi-steel	to 300%
Steel costings	to 200%
Tough alloy steels	to 400%

#### KUTKOST SOLID TOOL BIT PRICE LIST (Now ready for delivery)

Size	Price Each	Size	Price Each	Size	Price Each
1/4 x 1/4 x 21/4 5/16 x 5/16 x 21/2		% x % x 3 7/16 x 7/16 x 3		1/2 x 1/2 x 4 1/6 x 3/6 x 4	

### GENERAL TOOL AND DIE CORP.

555 PROSPECT ST.

EAST ORANGE, N. J.

March,

ROD CUTTING

With One Tool!

No. 4 HANDNIB

National
MACHINE TOOL CO.

RACINE • WISCONSIN

with the state of the state of

Shears flat stock up to 3/16".

Cuts rods from 3/16" to 3/8"
diameter.

Write for complete details on this time and labor saving Handnib.



### FEDERAL

PRECISION MEASURING INSTRUMENTS

Chicago Cavalant Organ Agusta Constitution (Chicago Militages Manita) Section (Chicago Manita) Manita (Chicago Manita) Political Constitution (Chicago Manita) Section (Chicago Militage) Section (Chicago Militag

## EQUIP YOUR PRESS FOR DEEP DRAWING

for as low as 50.00 complete

Convert Your Single Action
Presses Into Double Action
Presses With Dayton Rogers
Pneumatic Die Cushions.

This Die Cushion is a complete, self-contained, easily attached unit that automatically maintains a predetermined cushioning pressure on either the drawing or pressure pad at all times.

Available in size from 5" to 24" with a maximum drawing capacity of 10" and ring holding pressures up to 15 tons.

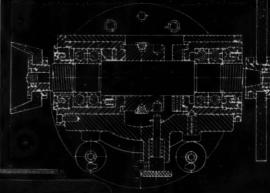
Write for complete details.

### DAYTON ROGERS MFG. CO.

2835 12th Ave. S. Minneapolis, Minn.

### **BOTH ACCURATE AND FAST**

ND. 22
UNIVERSAL
CUTTER AND TOOL
GRINDER





SPEED, accuracy, flexibility are assured by the sleek, functional design of Covel No. 22. This Cutter and Tool Grinder is built to condition today's tools—and tomorrow's. Write, wire or phone for Bulletin MM-33, name of nearest dealer.

## Take A Look At The SPINDLE For Instance

- ★ Large diameter mounted on spring-loaded precision ball bearings.
- \* Bearings mounted in quills.
- \* Spindle lock handy to operator.
- \* Three-speed V-belt drive.
- Spindle's left-hand end tapered for grinding-wheel collets. Righthand end straight for small diameter cup grinding wheels.

**Prompt Delivery to War Industries** 

Shorten Employee-training time with Covel equipment.

OVEL INDUSTRIAL COVEL MFG. CO., BENTON HARBOR, MICH.

2

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### RIVETT

### 608 WITH VEE BELT DRIVE

In Tool-Making and Instrument Shops It Will Handle Great Variety of Jobs in Minimum Time

Rivett No. 608 is a super-precision, back-geared screwhe designed for fine manufacturing, repair and cui ng and instrument shops it will har precision lim

of a fully equipped No. msh his work completely without recourse to other nihes, and throughout his entire series of operations to utilize the inherent precision of the lathe itself.

rel



Milling



608 GEARED

BENCH

**Multiple Operations** 

#### SPECIFICATIONS

With Flat or Vee Belt Drive

Swing over bed, dia
Length of bed
Distance between centers 1814"
Collet capacity, max dia
Step chuck capacity, max, die
Jaw chuck capacity, max, dia
Spindle capacity, mox. dia 14"
Slide rest, travel of top slide 514"
Slide rest, travel of cross slide 41/4"
Feed range, through goar box
.8015" to .0220"



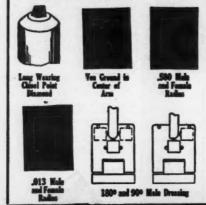
For Further Description Write for Bulletin 608

LATHE & GRINDER INC.



Hands are kept away from under the wheel.

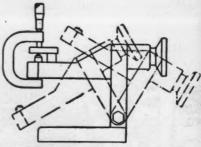
The C-66 is mounted directly on magnetic chuck and will accurately dress wheels to both male and female radii... without dismantling machine. For dressing wheels for grinding turning tools, the dresser is set at an angle equal to clearance angle of tools. The C-66 is the only radius dresser with this feature.



### NEW

C-66 RADIUS DRESSER for Any Make of Surface Grinder

Accurate
Safe to Use
Thoroughly Practical



Setting diamond with micrometer for accurate radius.

PROMPT DELIVERY FROM FACTORY IN NEWARK.

Prices
Without Diamond . . \$82.50
With ¼ k. Diamond 87.50
Send for New Catalog.

### SCHULTZ & ANDERSON CO.

MACHINE TOOLS

109 EDISON PLACE

NEWARK, N. J

### FOR FASTER, BETTER MILLING



### A NEW DESIGN AND AN IMPROVED CARBIDE

that . . .

Perform at extraordinarily high cutting speeds; Permit the milling of heat-treated alloy steels: Produce highly burnished surfaces; Result in a high production rate.

The new design and the improved carbide are described in our "Hyper-Milling" Bulletin FE-106, which is yours for the asking.

Firth-Sterling

CLEVELAND . DAYTON . METROIT . CHICA

### **Tungsten-Titanium** Carbide

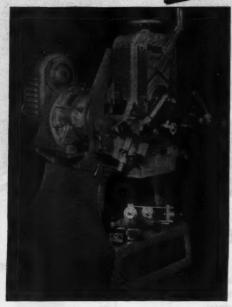
The selection of Firthite Tungsten-Titanium Carbide for milling and almost all other STEEL-CUTTING operations avoids the use of Tantalum-a "scarce" and "critical" material.



FIRTHITE FIRTHIT



# Helping Reach the goal of A PLANE EVERY 8 MINUTES.



It has been said that the aircraft industry's goal is a plane every 8 minutes! Whether this goal has been reached — or exceeded — is a military secret. But Buffalo Aircraft Type Bending Rolls are on the job every minute, helping push production ahead. These exceptional tools embody every principal feature requested by aircraft builders plus a "Fourto-One" Variable Speed Drive for ease of control and increased output.



### **BUFFALO FORGE COMPANY**

388 BROADWAY

BUFFALO, N. Y.

Branch Engineering Offices in Principal Cities
Canadian Blower & Forge Co., Ltd., Kitchener, Ont.



BENDING ROLLS

from can mun

### HOW AND WHY

### WILLIAMS' TOOLS AID WAR PRODUCTION



With "C" Clamps now widely used in many phases of war industry and construction, information on the various standard types is timely. Williams' Clamps are all dropforged from selected steel and heattreated. Screws are made of special steel, hardened and tempered. A description of the various Williams' patterns, for light, medium, heavy and special duty, follows:

WILLIAMS' "VULCAN"

for heavy service



11 sizes, with maximum capacities from 3/4" to 12-1/2". Long screws can be furnished providing a minimum capacity of 0. Screws threaded U.S. Std.

### "C" CLAMPS

WILLIAMS' "AGRIPPA"
for general service

C

8 sizes, with maximum capacities from 3" to 18". Fitted with dropforged swivel and screws having sliding pin handle, and threaded U.S. Std.

WILLIAMS' "DEEP THROAT"

for light duty and welding



7 sizes, with maximum capacities for 2" to 12". Furnished in two finishes: Standard for general service; Spatter-Resisting for welding, completely cadmium-plated to resist adherence of welding spatter. Screws have special thread for strength and rapid adjustment.

WILLIAMS' "VULCAN" TOOL-MAKERS CLAMPS



Furnished in 2 types: with plain and with swivel screw. Each type in 4 sises, with maximum capacities as follows: plain screw, 1" to 4:1/4"; swivel screw, 3/4" to 4". All screws have wings shaped to permit use of lever in tightening. U.S. Std. thread.

WILLIAMS' "VULCAN"
PARALLEL-JAW CLAMP
for Machinists' use



4 sizes, with maximum capacities from 1-1/4" to 4-1/4". Screws threaded U.S. Std.



Sold by Leading Industrial Distributors Everywhere . . . J. H. Williams & Co., Buffalo, N. Y.



# Grinding Surfaces to .85—1.3 Microinch Surface Finish



using CORTLAND CHUCKS and SEGMENTS

Work called for grinding the flat surfaces on 5° O. D. ball bearing rings. Equipment consisted of Blanchard No. 18 Verticle Surface Grinder with rotary table. In our production tests we used 18" Cortland Segmental Chuck with four segments, as illustrated. These tests soon established the following record:

Rate of Feed	.016
Table R. P. M.	25.0
Total Feed	.002
Stock Removed	.001

Wheel Wear			.001
Dressings			none
Profilometer	Reading	.85	te 1.3
	Microinch	surface	finish

The company is now grinding all flat surfaces well within the required 2 Microinch surface finish, using their regular grinding machines equipped with Cortland Chucks and Segments, and is maintaining a high production schedule . . . Write for Segmental Chuck Bulletin — free — and for information on grinding wheels of all types.



CORTLAND Segmental Chucks
CORTLAND GRINDING WHEELS CORP. • CHESTER, MASS.



Performance Guaranteed

> Faster Delivery

every phase of broaching. They know that a broach, more than any other tool, must be correctly designed in the first place or no amount of adjustment can make it produce properly. Any broach and fixture designed and manufactured by the Detroit Broach Company is guaranteed to do the job exactly as required.

When your broaches and fixtures are designed at

When your broaches and fixtures are designed at Detroit Broach, delivery is expedited considerably. Delivery dates are determined by the date of placement of the order. Delivery time is the same for designing and manufacturing as it is for manufacturing alone. Consequently your time required for designing is completely saved . . . often a matter of weeks in these strenuous times.

Take full advantage of Detroit Broach's experience and facilities. Let Detroit Broach engineers carry full responsibility for your broaching operations.

DETROIT BROACH COMPANY

20201 SHERWOOD AVENUE . DETROIT, MICHIGAN



Large reprint of this cartoon, without advertising matter, suitable for shop bulletin boards, furnished FREE upon request.

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#### I. DON'T "OVER-WELD" FILLET JOINTS

If a job calls for a 3/16'' fillet, don't pile on extra electrode metal to play safe. Proper joint design includes an ample safety factor, and exceeding design dimensions merely wastes electrodes. For instance, if dimensions are doubled — to  $3_6''$  legs instead of 3/16'' — four times as much deposit metal is used.

#### 2. USE THE LARGEST ELECTRODE AVAILABLE

Using larger diameter electrodes speeds up deposition of metal, and choosing an 18" length instead of 14" means fewer electrode changes for a given length of weld.

Following this method will increase welding speed 25% to 50% and save 3%-4% stub loss.

### CONSERVE ELECTRODES FOR VICTORY!

Use electrodes down to a 2 inch stub

Make legs of fillet welds equal

Make face of fillet welds

Store welding electrodes in a dry place.

Free copies of this poster available





Reduction

General Offices: 60 EAST 42nd ST., NEW YORK, N. Y.

MAGNOLIA-AIRCO GAS PRODUCTS CO. OFFICES IN ALL PRINCIPAL CITIES



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IDLE CYLINDERS ARE PRODUCTION SLACKERS! Keep am telling for victory

# SOLD FIRS

# Thor

1/4" ELECTRIC DRILL

WITH HOUSINGS OF

# MORNE

Under Army Contract for almost a year, Thor plastichousing 1/4" Electric Drills now are available for general distribution.

Check these OUTSTANDING ADVANTAGES

- MORE POWER PER
- LIGHTER
- . COOLER TO HANDLE
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- · COMPACT
- GREATER PROTECTION FROM SHOCK

OUT O' THO! LABOR TO SEE THE SEE ON THE SEE THE SEE THE SEE ON THE SEE THE SEE

Ploneered by Ther, they were the first successful major electric total development to conserve gluminum. Actuel, day-ofter-

days to provide the providence of the providence

With current military requirement searing completion, these Ther "plants drills are now available to war industrie

### UNCLE SAM! UBLIC APPEARANCE

**U14K** 

### "Thorite" OFAR CASE COVER

Held in position with metal pro-tection nut threaded directly to inner metal skeleton frame and locked against metal center-

These "THORITE" plastic drills
These "THORITE" plastic drills
The powered by the famous
Thor hext-duty motor; have "S.
Thor hext-duty motor; have "S.
Into hext-duty motor; have "S.
Into

### "Thorite" FIELD CASE

Slides over skeleton frame, is held in keyed position against metal centerplate and locked by grip handle which is securely screwed to inner metal frame.

Bearings, gears, statos, armature, centerplate and other internal power unit parts are supported on a sturdy, inner metal keleton frame to insure close folerance in alignment of work-

### "Thorite" GRIP HANDLE

Slides over end of inner metal frame, is held securely against field case in keyed position and locked directly to inner frame by screws.

The plastic housing does not support any working members of the machine, but serves simply as a protective covering for the inner, independent assembly of the tool.

Portable Pneumatic and Electric Tools

INDEPENDENT PNEUMATIC TOOL COMPANY



600 W. JACKSON BOULEVARD, CHICAGO, ILL. .

Branches in Principal Cities



THOR'S 50th YEAR



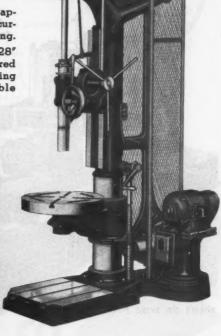


Intensive machine drilling is just as important in the industrial army today as military drilling in the armed forces. And Sibley Drilling Machines are high in the ranks of the most popular equipment of this industrial army.

Operators and managers really appreciate the Sibley's versatility, accuracy and speed for all purpose drilling.

Manufactured in 20", 24", and 28" swing with individual drive, 25" Geared Motor Drive. Coolant pump, tapping attachment, square or round table are available if desired.





SIBLEY MACHINE & FOUNDRY CORP.

DRILLING MACHINE MANUFACTURERS SINCE 1876

in te





### LIBERTY PLANERS INC.

1009 WELLER AVENUE

HAMILTON, OHIO

MODERN MACHINE SHOP

March, 1943

eq

### HIGHEST TAPPING PRODUCTION

IS YOURS WITH THIS COMBINATION

# Ettco-Emrick TAPPING MAGHINE MULTIPLE TAPPING HEADS ADVISORY SERVICE

All of the factors which determine high tapping production are provided in this Ettco-Emrick combination.

- 1. THE TAPPING MACHINE provides the means by which even unskilled operators—male or female—can do fast, accurate tapping because the skill usually required is BUILT INTO THE MACHINE. All the operator has to do is feed the work and step on the foot pedal.
- 2. THE MULTIPLE HEADS provide the means for tapping the maximum number of holes simultaneously.
- 3. THE ADVISORY SERVICE which goes with every Machine and every Head, consists of recommendations on the best method of handling specific parts including work holder designs, and on the right taps for the job. Users have often told us these recommendations, based on 25 years of specialization in machine tapping, are alone worth the price of the equipment.

### THESE BULLETINS GIVE THE DETAILS

BULLETIN No. 4 covers the Tapping Machine.
BULLETIN No. 3 covers the Multiple Heads.

Copies mailed on request. Write for them.

### ETTCO TOOL CO.

598 Johnson Ave., Brooklyn, N. Y.

DETROIT

CHICAGO

A 2-spindle Head is standard equipment on the Yapping Machine.



### How it happened to be designed

THIS MACHINE was designed as a result of a problem that was brought to us by prominent crankshaft manufacture. He was drilling, reaming, and tapping on a radial drill. Because these operations were performed on a single spindle machine he felt his production was limited. The machine illustrated and described here shows how we licked the problem for him. Not only was his production stepped up considerably, but a great saving in labor hours was also achieved.

The designing and build.

The designing and building of this machine is only one of the examples of the many diversified problems that are daily occupying our attention.

If you have any problems of production capacities of machines, let us help you work them out. We invite discussions with your engineers.

BUY WAR BONDS

THE UNUSUAL PLEXIBILITY of this machine recommends itself to manufacturers of crankshafts whose large volume production is divided into comparatively small runs of many different models.

The three spindles, spaced in a circle 120 degrees apart, can be moved in or out from center to any diameter from  $5\frac{1}{2}$  to 10 inches. Indexing of head makes possible the drilling of flanges having 3, 6, or 12 holes.

For drilling and reaming, spindle head movement is controlled by hydraulic circuit which allows rapid advance, coarse feed, fine feed, and rapid return.

Tapping is accomplished by disconnecting slide from hydraulic cylinder and using star handle to feed taps into work.

Four speed transmission provides wide range of speeds for drilling and tapping.

Thus, drilling, reaming, and tapping are all possible at one setting.

A special fixture at the right can be set up for any model crankshaft.

Because of its remarkable flexibility, this machine makes an ideal compromise between a single spindle setup and one having fixed spindle drill heads requiring individual fixtures for each piece of work. On this machine, setups for short runs are easily made and production is

LEMOUPE TOOL & MFG. CO.
2659 S. TELEGRAPH ROAD A DEARBORN, MICHIGAN

considerably increased over single spindle operations.

ENGINEERS AND BUILDERS OF PRODUCTION MACHINES

Marc

# Attention Gage Users!

IMMEDIATE DELIVERY



WESTERN



Con I the following received, undered to the house on beach housefy which are hearing operand to

YOU ARE OFFERED IMMEDIATE DELIVERY
FROM COMPLETE STOCK ALL MODELS ALL
SIZES AGD ADJUSTABLE SNAP GAGES STOP
ORDERS SHIPPED WITHIN 24 HOURS
THE SHEFFIELD CORPORATION

### HOW TO ORDER

State Frame Model and Frame Size. Stipulate whether gage is to be set and sealed. Give complete marking instructions if set and sealed. FOR SPECIFICATIONS

SEE SHEFFIELD HANDBOOK

No. 42-2

PAGES 150-153

THE SHEFFIELD CORPORATION

DAYTON, OHIO, U. S. A.



# Better 700l Room Grinding SPEEDS War Production



### ABRASIVE COMPANY

Standard Specifications
Tool Room Grinding Wheels

Broaches
Cutters
Die Blocks
Die Blocks
Drills—Small
Drills—Large
Gears
Hobs
Machine Shops
General Offhand
Reamers
Stellite Cutters
W60- J- KY
W46-G- KY
W60- J- K8
W60- J- K9
W60- J- KY

Lathe and Planer
Light Offhand 46-M-DY
Heavy Offhand 46-N-D9
Heavy—Large
Wheels 30-O-D9
Fixture
Grinding W46- J-HY
Tungsten Carbide Tools

Roughing—
Offhand G601- I- V9
Semi-Finishing—
Offhand G80 -H- V8
Finishing Offhand G120- H- V8

Write for copy of our Grinding Wheel Data Book.

ter grinding results in your tool room. Your cutting tools are vital production tools for war production. By keeping them at peak efficiency you are speeding production of the materials of war!

- Sharpen tools and cutters frequently . . . before the cutting edges become too dull . . . otherwise you waste time and metal in renewing an overly dull edge.
- Use fine grain abrasive wheels...for finish grinding the cutting edges of milling cutters, hobs, reamers, broaches, lathe and planer tools, etc... to obtain keener edges that last longer.
- Do not quench a hot tool edge in water during offhand tool grinding. You will check and crack the cutting edge.
- Frequent dressing and truing of the wheel face permits best precision grinding. However, excessive dressing wastes the abrasive wheel.
- Use open-density wheels for grinding the newer, tough alloy steels after heat treating. The open-density wheels have a wider grain spacing which provides chip clearance for the abrasive cutting particles.
- Use the proper grain and grade of abrasive wheel for your work, ABRASIVE COMPANY "white" and "red" Tool Room Grinding Wheels have been standard for many years for all types of tool and cutter grinding. Use the one best suited to your job.

### **ABRASIVE COMPANY**

DIVISION OF SIMONDS SAW AND STEEL CO.

TACONY & FRALEY STS. PHILADELPHIA PA. DISTRIBUTORS IN ALL PRINCIPAL CITIES



### A Putnam Hi-Speed End Mill

always provides maximum speed in cutting, making possible exceptional finishes with the milling operation alone. Putnam End Mills, on any job, can be depended upon for minimum breakage—a guarantee of full production efficiency in milling.

### KEEP YOUR CUTTERS Sharp

Check the sharpness of your cutting tools regularly. Don't continue to run them after they have become dull. Dull tools soon become broken tools.



### PUTNAM TOOL COMPANY

2981 Charlevoix Avenue . Detroit, Michigan

### NO. 1 AIR BASE

For Tooling, Special Production and Standard Air Service Equipment

Propeller Protractor

Above: Special Spline Gage for Propeller Shaft

Left: Propeller Balancing Stand

Below: Taft-Peirce Back Spot Facing Machine



Universal connecting rad boring fixture for aircraft motors



Propeller-checking Plate



# GEAR PRODUCTION Shifts into High

### UNIGUI

permits up to 83% more tank gears cut per tool change

Early in the war effort this manufacturer decided his production rate had to be stepped up. He called a Sun Doctor of Industry—a metal working expert—who stud-ed conditions and recommended a change in cutting ubricant. Sunjout the transparent sulphurized cutting

Sunicut they are now able to cut as many as 83% more gears between tool changes.

SUN PETROLEUM PRODUCTS ....





No-not when she tramps on your corns or your heart but when she steps on the foot pedal of a General Flexible Power Press.

Then, she controls the movement of the ram, and the pressure applied as easily as she operates the brake of her car.

The ram pressure delivered by any capacity G-F-P Press is in direct ratio to the foot pressure applied. The foot pressure is only as much as needed. The ram returns automatically when the foot pressure is released.

Very important today is this ease of operation, when women must replace men on so many operations.

G-F-P Presses are made in capacities of 3 to 60 tons.

WRITE FOR DESCRIPTIVE LITERATURE

GENERAL MANUFACTURING COMPANY
6433 FARNSWORTH AVE., DETROIT, MICHIGAN

GENERAL HEXIBLE
POWER PRESS

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# "WORK SIMPLIFICATION" and SPEED-UP begin here

For the vastly increased production now called for under the Victory program, industry is looking to "work simplification" and speed-up...largely a process of adding the right electric tools in the right places, through careful job analysis. In the foreground of such planning in thousands of plants are Millers Falls portable electric tools, built for trouble-free service on dozens of repetitive operations. Millers Falls drills, nut runners, screw drivers, grinders, sanders, and hammers — well-spotted, applied according to plan — are saving precious time, cutting production cost. 

Work-simplification-and-speed-up — long a Millers Falls selling slant, now our customers' buying slant — is paying the country dividends.



"Built-in experience" distinguishes Millers Falls electric screw driver No. 50; by that we mean its "Adjustomatic" clutch, which lets inexperienced operators work rapidly, setting up screws to pre-selected tension. Weight 43/4 lbs.; full range of speeds; AC or DC.

MILLERS FALLS COMPANY
Greenfield, Mass.

Manufacturers of FINE HAND TOOLS, PRECISION TOOLS, PORTABLE ELECTRIC TOOLS, and HACK SAWS

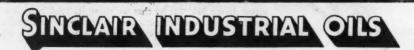


#### ... SINCLAIR CUT-TING OILS AND

COOLANTS. These oils promote high precision and fine finish in stepped-up operation, with less time out for tool regrinds.

Write for "The Service Factor"—a free publication devoted to the solution of bubricating problems.





FOR FULL INFORMATION OR LUBRICATION COUNSEL WRITE NEAREST SINCLAIR OFFICE SINCLAIR REFINING COMPANY (Inc.)

2540 WEST CERNAK ROAD CHICAGO

10 West STST STREET RAITO BLDG.

BIALTO BLDG.

573 WEST PEACHTREE STREET ATLANTA

FAIR BUILDING FT WORTH

56 MODERN MACHINE SHOP March, 1943

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Photo by U.S. Army Signal Corps.

### .. in the Mechanical "Brains" of our Fighting Forces ...

With their own unaided senses, our fighting men could never win a modern war. Precision instruments are their mechanical "brains"...searchlights "see" the invisible enemy...sound locaters "hear" him hundreds of miles away.

Because it must withstand the gruelling strains of war service... because it must not fail in the field... this vital equipment can include no "doubtful" materials. The smallest detail must be as nearly perfect as human skill can devise. That is why Parker-Kalon Quality-Controlled Socket Screws are "on the preferred list" of many manufacturers of important war aids.

The unparalleled check-routine supervised by the Parker-Kalon Quality-Control laboratory eliminates the "doubtful screws"... screws that look all right but fail to work right. You can be sure of the physical and mechanical characteristics of P-K Socket Screws... yet they cost no more! Parker-Kalon Corporation, 198 Varick Street, New York, N. Y.



"Quality-Controlled means . . .

Complete test and inspection covering: Chemical Analysis; Tensile and Torsional Strength; Ductility; Shock Resistance under Tension and Shear; Hardness; Head diameter, height and concentricity; Socket shape, size, depth, and centricality; and Thread fit.

# PARKER-KALON Quality Controlled SOCKET SCREWS

Give the Green Light . to War Assemblies



4 TIMES AS MANY SMALL PARTS PER LOAD BECAUSE OF GREATER GRINDING AREA

At the Sundstrand Machine Tool Company, grinding time on small parts has been cut in half with their Mattison High-Powered Precision Surface Grinder. One reason for this substantial saving in grinding time is the greater load and grinding area of their Mattison Grinder. To illustrate—gear parts shown on the above machine were formerly ground 6 pieces per load. With the Mattison Grinder, 28 pieces are ground simultaneously. Similarly the Lathe Slides were formerly ground one at a time. With the Mattison-4 pieces can be held in the grinding area. Both of these jobs are held to within limits of a few tenths. On numerous other small parts similar results are obtained. Write for the free Set-Up Book, containing further examples, showing how others have reduced time and increased production with Mattison Grinders.

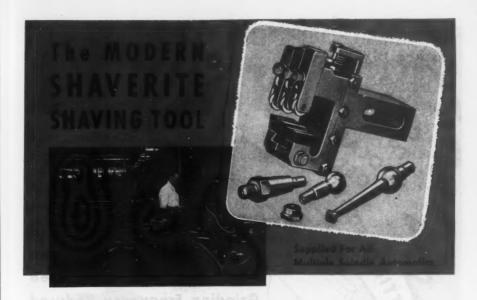


- MATTHSON

MACHINE WORKS

ROCKFORD . ILLINOIS

Marc



# Provides GREATER UNIFORMITY CLOSER TOLERANCES · HIGHER FINISH In SCREW MACHINE PRODUCTION

Here is one screw machine tool that is proving of exceptional value in War Production. It solves the problem of producing highly acceptable screw machine products, even when the machines themselves are not functioning as accurately and efficiently as they should.

In some cases, slight machine irregularities such as variations in spindle play affect the uniformity of the finished parts. In addition to correcting conditions of this nature, the Shaverite Shaving Tool produces a greater accuracy and a better finish than is usually expected in screw machine production. In many cases, it eliminates the necessity for grinding and light jobs can be formed with this tool.

As illustrated, the Shaving Tool Holder features a dovetail slide with an adjustable gib. This makes it possible to eliminate all play, thereby making a far more solid and durable tool than is usual with similar holders. Write for full details.

### MODERN COLLET and MACHINE CO.

401 Salliotte Street

Ecorse, Michigan



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### ON YOUR NORTON CYLINDRICAL GRINDERS

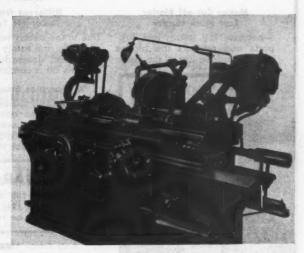
## INSTALL MASTERDRIVES

• It's a quick, simple job, because MASTERDRIVES are specially engineered for the job. The famous Master Speedranger applied on work head gives infinite variation of speed through a nine to one range, permits unusual control of finish. Precision balanced motor is standard on wheel head with speed to produce unusually fine finish. Feed drive to accommodate type of feed on machine. Independent pump drive where necessary. All these drives equipped with automatic belt tensioning devices . . . The complete MASTERDRIVE line includes 550 different specifications, covers practically every machine tool drive requirement.

Each unit complete, powered by a Master gear head motor.



We'll send name of
NEAREST REPRESENTATIVE
and latest
Masterdrive literature.
WRITE TODAY.



MASTERDRIVES applied to Norton Cylindrical Grinder

MASTER Electric Company

INDUSTRIAL EQUIPMENT DIVISION . DAYTON, OHIO

### **CUTTING-OFF**

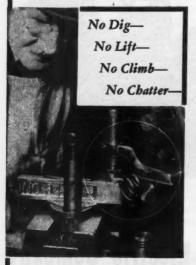
Now Made Much Easier for All Lathe Operators!

### Lombard Power-Feed Tool Holder Eliminates All Chatter

Cutting-off in a lathe has always been a most difficult job, because the stock jumps, lifts, and climbs on the tool. All this is now made impossible with the Lombard Tool Holder, because it is equipped with a steady-rest that rides over the work. Holds work down. Stock can't lift. Operates smoothly, without vibration. Makes cuting-off a pleasure.

#### Makes Cut-off Blades Last Much Longer

—because the steady-rest supports and protects the blades against sudden lifts of the stock.



It's the New Way to Cut-off!

#### Different from Any Other Cut-off Tool Holder

Due to the steady-rest support, it operates perfectly and safely on power or machine cross-feed. Instead of breaking the chip, it peels off a continuous ribbon.

#### **Operates Smooth and Steady**

Stock can't lift. Different—has a shearing action. Makes any lathe cut off even smoother than most screw machines—even though the lathe bearings are pretty well short. Makes tool cut like cheese.

### GUARANTEED

to be the smoothest cutoff tool ever used, or money will be refunded.

#### PRICES

For	12"	to	14"	Lathe										.\$16.75
For	16"	to	18"	Lathe										.\$17.75
		Ext	tra l	leavy	D	u	Y	1	M	0	d	e	ls	

Order Direct! Money-back Guarantee!

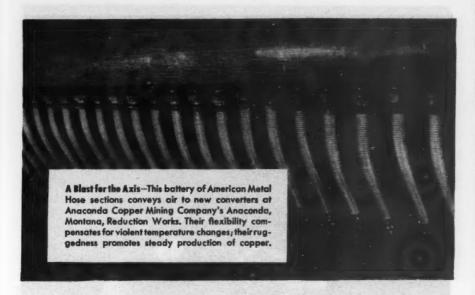
### LOMBARD MANUFACTURING CO.

16217 Linwood Ave.

Detroit, Mich.

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## Hose that conveys cold air under 15 lbs. pressure

### TO FURNACES HOLDING TONS OF MOLTEN COPPER

One of the most attractive features of flexible metal hose and tubing is its seemingly endless range of application. Using virtually any workable metal, we can build flexible hose or tubing for almost



American Seamless
—corrugated from
seamless rigid tubing
... no welds, laps or
joints...made in several alloys.

any purpose—from a simple spout to a high pressure seamless hydraulic line that can be flexed millions of times without breaking—a line that will give you the flexibility of garden hose, the dependability of metal and the strength of rigid pipe!



American Interlocked
— wound of strip metal,
joints packed; the toughest type of extremely
flexible metal hose.

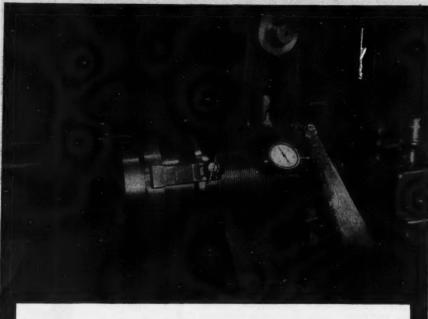
Whether you need a flexible connector for misaligned or moving parts, for isolating vibration, for conveying air, water, oil, steam or fuel, you'll likely find we have a type of flexible metal hose or tubing that will do the job more capably.

ANACONDA

American Metal Hose

AMERICAN METAL HOSE BRANCH OF THE AMERICAN BRASS COMPANY
Subsidiary of Anaconda Copper Mining Company
General Offices: Waterbury, Conn. • In Canada: Anaconda American Brass Ltd., New Toronto, Ontario

ECONOMY GRINDING OIL No. 1654 grinding threads on Nitralloy steel cylinder barrel, Wright Cyclone Aircraft engine



Here is an extremely severe operation . . . precision grinding round top and bottom buttress thread. It takes a mighty good oil to grind this type of thread . . . root, crest and flanks in one operation without burning.

Maintain your production plus with ECONOMY GRINDING OIL which gives you definite temperature reduction at interface of wheel and work . . . reduction in pressure between wheel and work . . . free cutting, greater accuracy of form and contour.

New catalog E-16 well worth having. Yours for the asking.

HEWHITE & BAGLEY COMPANY Detroit

WORCESTER, MASS.
Detroit Minneapolis

MODERN MACHINE SHOP

March, 1943

March,

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# TANNEWITZ HIGH SPEED METAL CUTTING BAND SAWS

Means of Cutting
TEMPLATES

from SHEET STEEL up to 1/4"

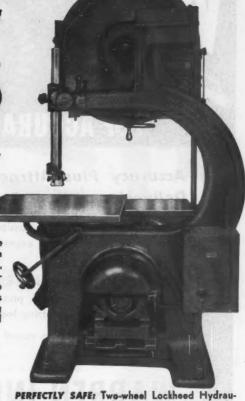
#### NON-FERROUS MATERIALS

of all kinds up to 3" thick — see chart below

#### SAVE THEIR COST IN SHORT ORDER

These superb machines, delivering over two miles of saw blade travel per minute without vibration, are doing hundreds of metal cutting jobs in a fraction of the time previously required, in metal working plants of every description throughout the country. To increase production and make important savings get the details NOWI A line requesting Metal Cutting Band Saw Bulletin will bring them to you promptly.

-01	THICKNESS AND PEED PER SECOND ON INCHES							
KIND OF MATERIAL	1/2	1/6	16	16	1/2	1	2	3
MILD STEEL	12-24	6	3	1				
STAINLESS STEEL	6	2	1					
YELLOW BRASS, ZINC	24	12	6	3	14	1/4	1	3/4
BRONZE OR COPPER	6	3	14	34	76	14		
ALUMINUM	24-36	18	9	4%	2	11/6	1	34
DURALUMINUM	24	12	6	3	15	1	14.	15
SINGLE PLYMETAL		11	1	6	4			
DOUBLE PLYMETAL				4	3			
PLYWOOD	24-36	24	20	16	12	6	3	14
ASBESTOS BOARD	12	6	3	13	34		100	
FIBRE (HARD)	24	12	6	1/8				
PAPER BOARD	24	18	12	4	2	1/4		
MASONITE	2.4	18	12	6	3	14	N	30
BAKELITE	12	6	3	14	34	Ha.	16	



PERFECTLY SAFE: Two-wheel Lockheed Hydraulic Brakes automatically and instantly stop the wheels in case of saw blade breakage — completely guarded.

Incorporated in Tannewitz High Speed Band Saws are many highly developed, patented features found in no other band saws.

Made by Sawing Machinery Specialists

THE TANNEWITZ WORKS, GRAND RAPIDS, MICHIGAN



### for ACCURACY-LONG WEAR

## Accuracy Plus Attractive Deliveries on Your Round Work Needs

Accuracy we have made possible for you by combining thorough engineering and expert workmanship with relentless inspection.

Attractive deliveries are assured you through special tooling equipment we have devised, plus our long experience in the manufacture of special cutting tools to customers' blue prints.

Send us your inquiries on round work needs — for prompt estimates.

## WARREN INDUSTRIES

26667 Mound Road, WARREN, MICH.

Dependability in WORKMANSHIP and DELIVERY

March, 1943

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March



Pull up a chair for Bryant

When your desk is snowed under with problems, production plans and blueprints, pull up a chair for Bryant. For every phase of a new job that relates to internal grinding is a phase that interests Bryant . . . every angle and opportunity whereby time, money, stock or operations can be saved on these phases is a chance for Bryant to help you.

Today, Bryant engineering service—vastly stepped up to meet the urgent needs of armament—is more than ever geared to meet the equally vital problem of planning new products that can be made economically and sold at a profit when peace returns!

This is an added reason for the forward-looking executive to "pull up a chair for Bryant."



#### BRYANT CHUCKING GRINDER CO.

Springfield, Vermont, U.S.A.



MODERN MACHINE SHOP

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That's why R. G. Has Avenue, (

FOR AL

-faster

#### HAVING TOLERANCE PROBLEMS ON TAPPING OPERATIONS?

2 FEATURES
Insure Continuous, Trouble-Free
TAPPING PRODUCTION

... and only Haskins has them

WITH HASKINS TAPPERS ON THE JOB there's no loss of valuable production time, no wasting of vital war materials, because of failure to maintain tolerance requirements.

Air Operation uniformly controls the accuracy of the work. To Class 4 fit when necessaryl Each part is precision tapped exactly like every other, every hour of the day. Tapping pressure is always precisely the same. Thus tap life is longer—much longer. And tap breakage is almost completely eliminated.

Piece Part Control, applicable on many jobs, makes tapping practically automatic. Placing the part in the fixture actuates a micro switch and—air does the rest—starting and completing the tapping operation. The operator's two hands are free to feed parts—faster than by any other method.

That's why tapping the Haskins way is definitely more accurate, definitely less costly. R. G. Haskins Company, 620 S. California Avenue, Chicago.

European Representative: G. E. Marbaix, Ltd., Humgias House, London, S.W. I.





HASKINS Precision

TAPPING EQUIPMENT

FOR ADDITIONAL TAPPING FIPS send for our latest literature, devoted largely to war work. Gives many money-saving, money-making ideas. Free on request,





# JOHNSON

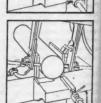
BANDSAW

4 CUTTING SPEEDS

10" x 18" CAPACITY

OTHER FEATURES:

Rigid box-type frame — Sturdy over-all construction—Three point base — Wide range in cutting speeds — Quick acting vise — Improved hydraulic control — Bolt action stock stop — Ball bearing motor — Extremely simple operation.

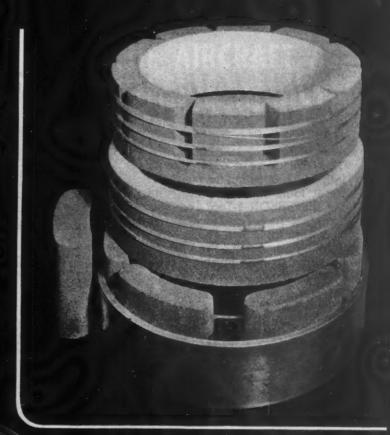


JOHNSON MANUFACTURING CORP., Albion, Mich.

Write for all details to: SALES OFFICE: 5000-4 CHRYSLER BUILDING, New York, N. Y.

WHI BLA GRII Use
BLANCHARD
WHEELS ON
BLANCHARD
GRINDERS









This Booklet contains information on the selection of grinding wheels for all kinds of work — sent free on request. Blanchard Grinding Wheels are manufactured by Blanchard, for use on Blanchard Surface Grinders. These wheels may be plain CYLINDER wheels, SECTORED wheels, or SEGMENT wheels.

As builders of the machines, Blanchard knows the exact wheel requirements for each job. All wheels are constantly being tested in operation.

No expense or trouble is spared to produce the freest cutting and most uniform wheels possible. All wheels are selected for grade, by mechanical means, after manufacture. Blanchard Surface Grinders operate at highest efficiency with Blanchard Wheels.

The BLANCHARD
MACHINE COMPANY
64 STATE STREET, CAMBRIDGE, MASS.

### ENGINE LATHE TO TURRET LATHE IN 15 SECONDS

Don't wait for Turret Lathes . . . You can convert any engine lathe into a complete precision turret lathe in 15 seconds with the JEFFERSON 4-Tool Tool-Post Turret, 5-Tool Tail-Stock Turret and Adjustable Pull Feed - and double its capacity. For forming, roughing, boring, finishing, drilling, tapping, etc.

Adjustable Pull Feed eliminates slow movement of tail-stock spindle and provides easy control. For any lathe up to 24" swing.

Jefferson Turrets are real production tools - substantial, rigid, accurate and adaptable to any size or make of engine lathes. They must not be confused with the small makeshift gadgets now on the market. Write for Details.

DELIVERY, 6 DAYS.



5-Tool Tail-Stock Turret accommodates five tools and each tool centers automatically when brought into position by means of an indexing plunger. Made in four sizes to fit small bench lathes up to lathes with 24" swing.

#### PATENT PENDING

4-Tool Tool-Post Turret carries four sepa-rate tools instead of one. Made in two sizes for standard 0, 00, No. 1 and No. 2 tool holders.



Photo below shows Jetterson Turret attachments on 16" Engine Lathe.

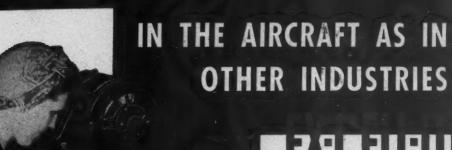


#### MACHINE TOOL CO. 750 W. Fourth St., Cincinnati, Ohio

Taal-Post Turrets, Tail-Stock Turrets, Adjustable Pull Feeds, Belt Sanders, Gyratory Foundry Riddles, Overhead Swing Frame Grinders, Milling Machines, Dividing Heads and Vises.

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## EXTELLO

#### Machine Tools Bring Speed and Accuracy to War Production!

TAKE aircraft engines, for instance. Since fateful December 7, 1941, U. S. aircraft engine production has increased, by horsepower, approximately 240%—actually, in dollar value, there is now more aircraft engine horsepower being delivered every 14 days by American industry than during the whole of World War I. In the turning out of these aircraft engines, Ex-Cell-O is a definite factor. Not only has Ex-Cell-O one of the country's largest precision aircraft parts divisions, but Ex-Coll-O precision machine tools are being used extensively throughout the aircraft industry to produce the many thousands of precision parts needed for aircraft engines. These parts must have a high degree of precision and finish . rigid specifications must invariably be observed . . . the parts must be produced as fast as possible. This is the reason why Ex-Cell-O precision machine tools are preferred by managements and workers for the production of these vital parts.

**EX-CELL-O CORPORATION • DETROIT** 

of a plunge cut by the tool on the appeals side. This feature eliminated considerable tool breaken, Former method for mechining this alcrest part required three set-ups and production was just non-third of that atlained in the one set-up shawn above. MACHINE: Ex-Cell-O 112-C Precision Bering.

Re-Cell-O for use in facing both sides of flenge and in turning hub diameter on each side, the fixture being operated by a hydraulic cylinder connected to the machine

rcuit. It carries four tungsten carbide tools at ore synchronized mechanically and

directions. The two tools negrer the operator

turn the hubs and the two at the rear of the

fixture face the flange at the same time. All four tools reach the end of their cut simultaneously. Thus, at the intersection of hub

O.D. and flange face, each tool is relieved

individual micro-adjustment in two

To got best use of your Ex-Coll-O precision bering equipment, you should have the Ex-Coll-O instruction Book. If you do not have it, write for free copy. State style of Ex-Coll-O machine you are using.

PRECISION THREAD GRINDING BORING AND LAPPING MACHINES + TOOL GRIND-IS + HYDRAULIC POWER UNITS + GRINDING SPINDLES \* BROACHES + CONTINENTAL UTTING TOOLS + DRILL JIG BUSHINGS - DIESEL FUEL INJECTION EQUIPMENT UREPAK CONTAINER MACHINES \* R. R. PINS AND BUSHINGS + PRECISION PARTS



# AN Essential TOOL HOLDER





Willard Spring Tool Holder \_\_ is an "essential" in our war-time machine shops and tool rooms. New in design, the "Willard" is efficient, accurate and economical - can be used for all types of threading, coarse or fine. Adaptable to a wide variety of work. The spring feature prevents shock to the cutter minimizes cutter breakage makes possible faster and smoother feed with heavier cut. Economical because it eliminates

chatter damaged work is reduced to a minimum. Made in three sizes for 'a . '16 and 's square tool bits. Specify "Willard" for accuracy and economy. Write for further information



# AUTO-ORDNANCE orporation

THOMPSON TOOL DIVISION WEST PUTNAM AVENUE, GREENWICH, CONN



EFFICIENT

PRACTICAL

\*

ECONOMICAL

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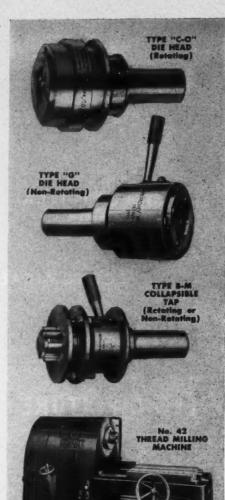
## Thompson MILLING FIXTURE

The Thompson Universal Milling Fixture, with the 3-way circular swing, converts any standard bench lathe, easily and quickly, into an efficient, time-saving milling machine. Lends itself readily to straight or angular milling by using vise and universal slide base without index fixture. For milling punches, key ways, end mills, "C" bores, or the manufacture of duplicate parts. Write for further information.

# AUTO-ORDNANCE Corporation

THOMPSON TOOL DIVISION

342 WEST PUTNAM AVENUE, GREENWICH, CONN





# CHERRY 2216

Your call will receive prompt, efficient attention at any time. We can assure prompt deliveries on all products.

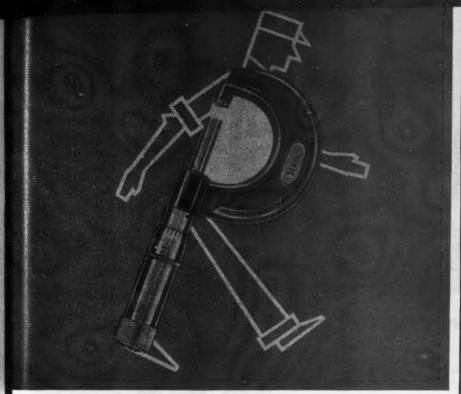
CALL TODAY.

## **MURCHEY MACHINE & TOOL CO.**

Die Heads, Collapsible Taps, Thread Milling Machines and Shell Tapping Machines

76

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### "MIKE" hasn't had a Furlough Since the War began . . .

STARRETT MICROMETERS have what it takes to live up to the most strenuous period of service precision measuring tools have ever faced. Despite the tremendous demand for "Mikes", the familiar and distinctively Starrett "heft" and "feel" and lasting accuracy have not been sacrificed. A genuine Starrett "Mike" gives a worker, new or old, that extra feeling of confidence that results in more and better work.

You can be certain that both the makers and distributors of Starrett Tools are doing their level best to get them into the hands that are speeding the day of Victory.

THE L. S. STARRETT CO • ATHOL • MASSACHUSETTS • U.S.A.

World's Greatest Toolmakers

## STARRETT

PRECISION TOOLS . DIAL INDICATORS . GROUND FLAT STOCK HACKSAWS . METAL CUTTING BANDSAWS . STEEL TAPES

## Rapid Duplication

Rapid MADELLIER MANNA PROCESSED COM

of RIGHT OR LEFT HANI THREADS

INTERNAL OR EXTERNAL

### COULTER

Type "H"





Any parts that can be held in ordinary chucks, air operated chucks, air operated collet chucks, or special face plate fixtures... can be threaded on this machine.

Set cam-controlled automatic cycle on first piece. Thereafter, cutter feeds into work to proper depth and at correct pitch and withdraws when cut is completed. Work and cutter spindles are driven by individual motors through worm drive, affording ample power throughout the wide range of feeds and speeds.

Write for complete specifications.

The James COULTER Machine Co.

BRIDGEPORT

CONNECTIOU

U. S. A.



#### **Cutters Give You More Production** When You Give Them More Care

Follow These Simple Suggestions . They Will Help You Increase Your Production HANDLE CUTTERS carefully to prevent dam-

age.

HAVE THE WORK CLAMPED AND SUP-PORTED PROPERLY.

MOUNT CUTTERS as closely as practicable to the spindle.

USE ARBORS OF SUFFICIENT DIAMETERS. Insert arbor shanks carefully in thoroughly cleaned taper holes. Ends of collars should not be bruised. Provide adequate arbor sup-

RUN SMALL CUTTERS (such as end mills) at the same surface speed as that used for larger cutters.

KEEP CUTTERS SHARP. When cutters are used after they have become dull, excessive metal is lost in sharpening.

IN SHARPENING, control cutter clearance

carefully and remember softer metals may require several times the clearance of cutters for

iron and steel. **COUNTERACT CHATTER.** Incorrect clearance and lack of rigidity of machine or cutter drive contribute to chatter.

BE SURE MACHINE IS HEAVY ENOUGH to stand the cut and use the correct spindle speeds with each setup. Supply ample coolant where it is required.

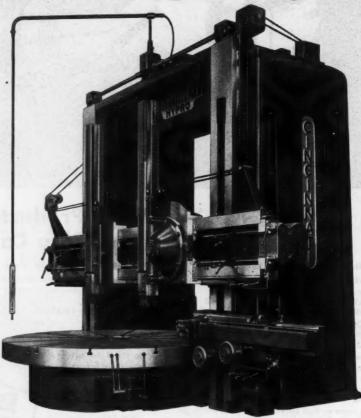
Give cutters extra care these days so that the production requirements for our armed forces can be maintained.



Reproductions of this advertisement for use on your bulletin board furnished on request-

BROWN & SHARPE CUTTERS

#### The Situation Demands Cincinnati Hypro Boring Mills



Because it is a general purpose tool this 10' Cincinnati Hypro Boring Mill can do accurate boring and turning after the war just as it now is used for ordnance. Write for Bulletin 175-M.

### The CINCINNATI PLANER Ca.

CINCINNATI OHIO, U.S.A.
PLANERS • PLANER MILLERS • VERTICAL BORING MILLS

# GRINDING SET-UPS LIKE THIS Mean LOST MAN HOURS...

**LOST MACHINE HOURS** 



# FULL PRODUCTIVE GRINDING TIME When You Use The MAGNA-SINF

The angular grinding set-up on the Magna-Sine, as shown directly above, was completed in *one-twelfth* the time required for that shown at upper right. It eliminated the need for V-Blocks, angle plates, sine bars, clamps and strap.

In addition to reducing set-up time to an absolute minimum, the Magna-Sine's precision construction makes possible the most accurate angular grinding work. Every angle is held to the same accuracy as the standard gage blocks which are used.

Magna-Sines are supplied in two sizes in both compound, and single angle models. Non-Magnetic models are also available for inspection purposes.

Write for full details.

## ROBBINS ENGINEERING COMPA

318 MIDLAND AVENUE

•

DETROIT, MICHIGAI



## FASTER WORK LOWER COSTS

Fewest Wheel Changes

# ADJUSTABLE SPEED SNAGGING GRINDER

MODEL 65
FOUR-SPEED
GEAR DRIVE
TRANSMISSION

7½, 10 and 15 h.p.

...for vitrified or high speed wheels

Your war effort speeds along on high in your grinding room because this is a heavy duty but fast snagging grinder.

And here's why it works so well:



efficient peripheral speed is maintained down to the flanges causing fewer stoppages for changing wheels and least expense for wheel replacements;

speed change by hand lever on front; one - piece chrome manganese steel grinding wheel spindle on four heavy duty bearings:

push button control with overload protection:

adjustable boiler plate steel wheel awards:

eye shields and shaft locking device.



82

THE UNITED STATES ELECTRICAL TOOL CO.

CINCINNATI, OHIO, U.S.A.

Am

Pla



- holding blocks drop smoothly off from positive cams no drag, no shave, no tell-tale marks;
- 3. The closest gauges used for checking pitch, lead, form and taper, prove that these tools will meet and hold not part but ALL of these essentials — on long production runs.

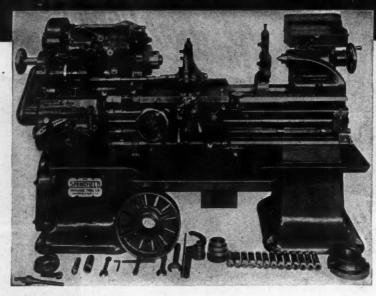
If you have pressure tight threads to cut, or any other out-of-the-ordinary threading problems, put it up to Namco Circular Chaser Dies.

Catalog D-42 explains "why" in detail.

WATIONAL ACMES

ALUMINUM

## PRECISION and LONG LIFE



SPRINGFIELD Precision LATHES fill the munitions makers' demands for (1) extreme accuracy and (2) maintenance of this accuracy and long life.

Here are some of the factors that account for the sustaining of the original accuracy built into each Springfield Lathe:

HEADSTOCK...12 speeds...only half of the easy-shifting spur gears mesh at one time. APRON...extra heavy...operates on ball and bronze bearings throughout. TAIL-STOCK...all bearings and bed ways oiled from one well.

The SPRINGFIELD LATHE is an outstanding value for both tool room and quantity production use. Write for Bulletin 162.

THE SPRINGFIELD MACHINE TOOL CO.

MODERN MACHINE SHOP

March, 1943

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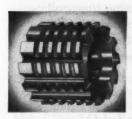
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# The PLAN-O-MILL is Accurate!

One big reason why Plan-O-Mill form and thread milling machines are obsoleting older and bulkier equipment is their ability to produce. But alongside Plan-O-Mill's amazing production record is a standard of accuracy that many slower, less productive machines are unable to attain.



Plan-O-Mill THREAD MILL-ING CUTTERS left) are made with the same regard for precision that is evident throughout Plan-O-Mill manufacture. For more information on how Plan - O - Mill can do your threading and form-milling job better, faster, and more accurately, contact the Plan-O-Mill dealer nearest you. See list at right.

#### PLAN-O-MILL CORPORATION

HAZEL PARK, MILI ROYAL OAK, PI MICHIGAN

MILLING

MACHINES

MILLING

CUTTERS

#### PLAN-O-MILL DEALERS

BOSTON, MASS. Stedfast & Roulston, Inc., 156 Oliver St. NEW YORK, N. Y. NEW YORK, N. Y.
Wilson-Brown Company,
Chrysler Bidg.,
405 Lexington Ave.
SYRACUSE, N. Y.
Syracuse Supply Co.
314 West Fayette St.
ROCHESTER, N. Y.
Syracuse Supply Co.
1245 University Ave. I345 University Ave.
BUFFALC, N. Y.
Syracuse Sapply Co.
1721 Elmwood Ave.
PHILADELPHIA: ARDMORE, PA.
Edward A. Lynch Mach. Co.
Times Medical Bldg.
PITTSBURGH: DORMONT, PA.
Voss Machinery Co.
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P.O. Box 7928
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Many plants, otherwise top-notch in efficiency, are losing time and money in the rough-cut department. That's why more and more are switching to Kalamazoo Metal-Cutting Band Saws! These modern precision machines allow cuts within thousandths of an inch — save machining time and precious metal. New, stronger type drive carries full 5500 pound load—double that of similar saws. New hydraulic control gives instant holds in any position on frame.  $8^{\prime\prime}$  x  $16^{\prime\prime}$  and  $8^{\prime\prime}$  x  $24^{\prime\prime}$  capacities. Send for complete specifications.

**Immediate Deliveries Now Available!** 

### MACHINE TOOL DIVISION

KALAMAZOO TANK & SILO CO.

**507 HARRISON STREET** 

KALAMAZOO, MICH.

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Di



Diamond Penetrator 1/16" Ball Penetrator 1/8" Ball Penetrator Metal Dust Cover Checking Anvil 3½" Anvil "V" Anvil Adjustable Steady Rest

Leather Cover for Instrument
Telescoping Cover for Elevating Screw
Oil Reservoir for Elevating Screw

Immediate deliveries available with priority certificate.

CLARK INSTRUMENT, INC.
10204 FORD ROAD
DEARBORN, MICHIGAN

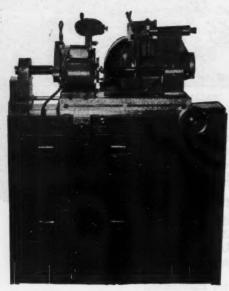
# GRINDALL EXTERNAL GRINDER TOOL GRINDER

# THREAD GRINDER MODEL B - 6" x 12"

FOR THREAD GRINDING CYLINDRICAL GRINDING TOOL GRINDING

The Model "B" is primarily a thread grinding machine for grinding highly accurate threads, external or internal, on thread gages, taps, machine parts, etc. When not engaged in thread grinding, it can be used very successfully for cylindrical grinding as well as internal grinding and also for accurate tool grinding, gage grinding, etc.

Threads can be ground faster than they can be cut with a single pointed tool and to far greater accuracy and quality of finish.



Model B for Grinding External or Internal Threads

Quick change-over from external to internal grinding.

Quick setup for thread grinding of various pitches of thread and various lengths and diameters of work.

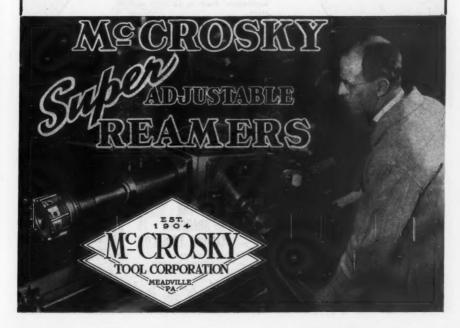
Quick change-over from thread grinding to other types of grinding, such as cylindrical, internal or other grinding operations.

GENERAL MACHINE TOOL CO.

SENECA FALLS NEW YORK

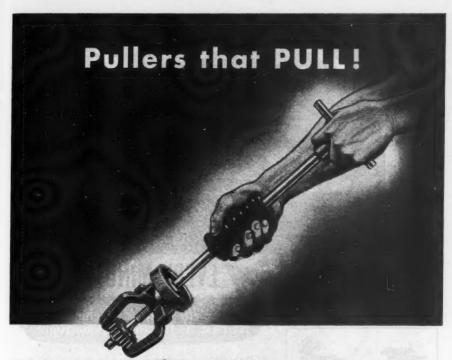


Full details in McCrosky Bulletin 16-A and the McCrosky Reaming Manual. THIS is a McCrosky SUPER Adjustable Shell Reamer mounted on a special bar for equipping one station of a turret lathe. The blades are securely held by the McCrosky time-tested pin and screw lock. They have large forward adjustment to compensate for wear and regrinding, and the life of the reamer can be repeatedly and economically renewed by inserting new blades in the original body.





Mar



## in the Complete Plomb Line

Designed to do a job, Puller No. 4056—a popular member of the Plomb puller family—pulls quickly, efficiently, safely. Together with many other fine hand tools in the famous Plomb line, it is helping to build better weapons—faster. If you need hand tools of highest quality to speed your war work, see your Plomb dealer. To supply the demand for Plomb Tools in war industries, 36 plants now make them in ever-increasing volume. This permits a two-fold service. If you need specially designed tools for hard-to-get-at war production problems, in quantity, consult the Plomb Tools Contracting Company Division. For regular tools contact the Plomb Dealer in your locality.



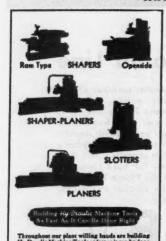


PLOMB TOOL COMPANY V LOS ANGELES V CALIFORNIA



Making EVERY MINUTE COUNT

Building Hy-Draulic Machine Tools As Fast As It Can Be Done Right



☆Walk through the shop any day or night - after establishing identity right down to your birth-mark, if any. But keep moving, and don't bother anybody. The place is full of earnest workers, grimly intent on making every minute count in building Hy-Draulic Machine Tools as fast as it can be done right. All on high-urgency orders, Hy-Draulic Machine Tools are required for vital war work because they can make every second of every minute count. Their hydraulic drives and feeds get the last ounce out of cutting tools, make it easy for operators to produce maximum quantities of highly accurate, finely finished work every shift. AThe 36" Openside Hy-Draulic Shaper and the Hy-Draulic Shaper-Planer are especially useful in handling a raft of work that makes the biggest ram-type shapers say "Uncle", yet can't be done as economically on other machines. Note: Peace-time features and advantages, that create increased demand for Hy-Draulic Machine Tools on war work, will be even more valuable in the peace that follows Victory.





Send us your specifications and blueprints—We will see that your job is set up with the right LIVE CENTER—prompt deliveries on high priorities.

# TOOL COMPANY 5222 THIRD AVE. DETROIT, MICH.

### "ROUGH RIDER" IN '98...



SMOOTH OPERATOR IN '43!

The soldier who FOUGHT under Teddy Roosevelt at San Juan Hill in 1898 can now PRODUCE under Franklin D. Roosevelt in 1943.

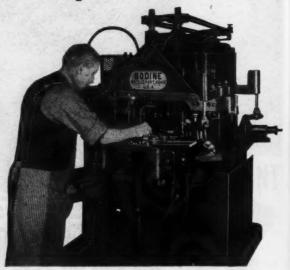
And many of them are doing it . . . with the help of automatic production machines such as the BODINE.

This Multiple Spindle DRILLING, MILLING, TAPPING and SCREW INSERTING Machine has been designed for high speed production, and because of its automatic indexing dial, easy feeding, and safety features, operators can be quickly trained to maintain a steady flow of small armament components.

Up to eight tools may be set up to operate vertically, horizontally, diagonally, or from an inverted position—one or all planes simultaneously, and all of the FOUR operations, if desired, during one cycle of the dial.

The operator merely places the work in a clamp and the various tools operate at successive stations as the dial is automatically indexed to position. Ejection is usually manual,





# DRILLING, MILLING, TAPPING, SCREW INSERTING Timultaneously

but on certain small parts it may be automatic. Hopper feeds are also practical on some jobs. Automatic safety devices protect machine and tools; assure safety to operator.

There are six sizes of Bodine machines with capacities for drilling and tapping up to  $\frac{1}{2}$ " dia. and up to  $\frac{3}{2}$ " in depth.

An added feature is the compact design. Even the largest size, which mounts 8 tools, requires but 90" x 96" floor space.

Send for Bodine's new bulletin which illustrates and describes these machines in detail.

# A.C.E. FOR Special CUTTING TOOLS



MANUFACTURED TO CUSTOMER'S BLUEPRINTS

#### A.C.E.'s MODERN METHODS

Above is shown a five spindle indexing fixture for milling spirals—one of A.C.E.'s advanced methods aiming at the goal of precision mass production.

At right—A.C.E.'s MODERN Inspection Methods exemplified by a sine bay specially designed by A.C.E. Engineers to improve inspection of high precision cutting tools.



Have us quote on your special cutting tools fee attractive deliveries and prompt estimates

## AMERICAN CUTTER



IND ENGINEERING CORP., WARREN, MICH.

SPECIALIZING IN HIGH SPEED CUTTING TOOLS TO YOUR PRINTS



CERTAIN TERRITORIES OPEN FOR ACTIVE AGENTS

WRITE FOR NEW ILLUSTRATED BULLETIN

AMERICAN CUTTER & ENGINEERING CORP., 31743 MOUND RD., WARREN, MICH.



Bulletin 92 is an analysis of short run piercing operations as applied to the piercing of sheets and plates up to  $\frac{1}{2}$  thick, produced on Wiedemann Turret Punch Presses with Gauge Tables.

Bulletin 92 shows the reasons why it was possible for a large manufacturer to cut production time on a special panel from 10½ hours to 73 minutes with a Wiedemann Turret Punch Press—and how another went into immediate production on a long run chassis contract while waiting for multiple dies to be made. Users report time and labor savings up to 2000% on short run piercing operations.

The Wiedemann Turret Punch Press with gauge table assures almost unbelievably low costs on short run piercing work. There is a size for every need — from 8 ton hand operated to 80 ton power driven.

Write today for your copy of Bulletin 92 — the answer to many a production problem.

WIEDEMANN MACHINE COMPANY
1821 SEDGLEY AVENUE, PHILADELPHIA, PA.

WIEDEMANN TURRET PUNCH PRESSES & CANCEL

# there IS a difference in taps

omminimum.

in thread GRINDING

for example:

All Sossner taps are PRECISION GROUND FROM THE HARD-ENED SOLID STOCK...an important reason for their strength, accuracy, and long life. Sossner taps are made with the very latest equipment, using our own newly developed methods.

TAPS AND GAGES OF AMERICAN NATIONAL AND BRITISH THREAD FORMS IN SPECIAL AND STANDARD SIZES

TAPS GAGES SOSSNER

STEEL STAMPS

161 Grand St., New York City or 27 B'way, Lynbrook, N.Y.

"32 year reputation for reliability and precision workmanship."

#### FULFLO PUMPS and VALVES

Send for your "personalized" copy of "The Fulflo Mechanical Data Book."





Model AG3M

# Where There's a Job to be Done FULFLO COOLANT PUMPS Keep It Cool

Model AG3M — One of about 75 coolant pumps . . . all built scientifically and from actual working experience. Special types, too, for special purposes.

Model AG3M is motor driven. Hardened steel sleeve shaft slips over motor shaft.

Other pumps in pipe sizes %" to 1½". Motor, direct or belt drives. Right or left rotation.



#### **BY-PASS VALVES**

Non-chattering. For maintaining specific pressures constantly. For pipe sizes 4" to 2". For pressures from 0 lbs. to 350 lbs. Cast iron or brass bodies. Piston type.



Specialties Co., Inc.

BLANCHESTER, OHIO

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# Back to the "Old Grind"?

... not once you've tried

### **CIRCULAR RELIEF GRINDING!**

5 Important and Exclusive Advantages are yours with Circular Relief Grinding:

- 1 Duplicates original shape of tool exactly.
- 2 Saves time because it grinds quicker and requires only one machine, one set-up and one operation.
- 3 Makes tools last longer; cuts replacement costs. (See diagram'below for "reason why".)
- 4 Simple to use—even for inexperienced operators.
- 5 In spite of these obvious advantages, Circular Relief Grinders cost less than ordinary grinders.

Write for free folder and get the whole story. It's too good to overlook!

UNSERT illustrates a milling vater being CIRCULAR RE-LIEF ground.

LARGE ILLUS TRATION shows how a ship or boiler reamer is ground the CIRCULAR RELIEF way.

TWO OPERATIONS
LEAVE "LAND"

TAND"

THREE OPERATIONS
LEAVE "LAND"

Connecing CIRCULAR RELEF With Conventional Grinding

Note how CIRCULAR RELIEF GRINDING follows the curve of the tool, grinds right up to the cutting edge, and does not cut away valuable metal supporting the cutting edge.



# CLEVELAND TOOL ENGINEERING COMPANY

9106 DETROIT AVE. + CLEVELAND, OHIO



For Perfect Performance at High Speed be sure your taps are kept sharp—and it they are WINTER H. S. Taps you may be sure they will stay sharp for long hours of fast operation.

No tool, however well made, can produce its full quota if abusively handled. It some of your newer employees don't know how nicely Winter Taps will perform if properly used; ask for the Winter Tap Data Booklet. Lots of non-technical, useful information in it on taps and tapping. A postal request will bring it.

THE NATIONAL TWIST DRILL & TOOL CO.



100

med

30%

slow

carb

no si

diam

Write

nishe

Marc



THOSE old machines can be switched from liabilities to real blue-chip producers without hocus pocus or black magic!

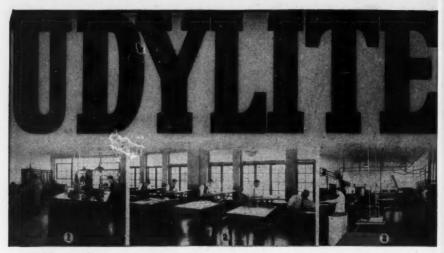
Simply drill four bolt holes and mount a correctly-sized Given Vari-Speed Drive. You'll immediately get:

30% more spindle speeds No sacrifice in original slow speeds Necessary r.p.m. for efficient use of carbide tools Rapid variable speed control with no steps or gaps Efficient, constant surface speeds on facing operations, increasing or decreasing diameters.

Write for our bulletin and blueprints showing various bracket designs. Recommendations and cost estimates furnished upon receipt of your machine tool list. Write today!



GIVEN MACHINERY CO., 3857 SANTA FE AVENUE, VERNON, LOS ANGELES, CALIF.



# Headquarters

## for ELECTROPLATING, POLISHING AND ANODIZING INFORMATION

For prompt, dependable metal finishing information, call on Udylite. No organization is better equipped to give you information gained from installing plating, polishing and anodizing departments in many leading manufacturing plants throughout the country.

Trained plating engineers and electrochemists are at your service. These men know metal finishing and they can help you plan a new installation or revise your present one for greater efficiency. They know, also, that you want information quickly.

Udylite has a complete line of equip-

ment . . . second to none in terms of quality and efficient performance.

and supplies... for every metal finishing need. Salts, acids, anodes, buffing and polishing materials—everything required. Call Udylite for prompt service on your finishing requirements. You pay no more for Udylite dependability.

1 Laboratory where efficiency of Udylite finishing processes is maintained by constant control. 2 Design and layout department where clients may obtain the advice of experienced metal finishing engineers. 3 Laboratory where all Udylite products are tested under actual plant conditions.

### THE UDYLITE CORPORATION

1651 E. Grand Blvd., Detroit, Mich.

Chicago

102

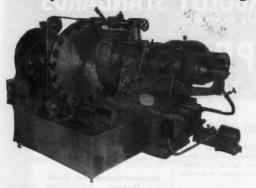
Long Island City. N.

Cleveland

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#### When you have flat surfaces to grind—BESLY GRIND them





THE FIELD OF THE BESLY GRINDER in keeping with improvements in grinding members (Besly Titan Steelbac Abrasive Discs) has broadened out remarkably.

Grinding of brass fuse plates to limits of .0002" for parallelism and flatness at the rate of 60 passes per minute; aircraft piston rings to within .0005" of

finished size at the rate of 80 passes per minute are examples.

Operations on armor plate, machetes, small arms, tank parts and other difficult grinding problems are no longer difficult when approached by Besly engineers. Nor are we limited to metal working. Steatite, refractories, hard rubber, synthetic molded products, brake lining, clutch facings and a myriad of other materials are daily being ground on Besly Disc Grinders.



Investigate the possibilities of Besly grinding. The progress made in this field of endeavor will surprise you.



CHARLES H. BESLY & COMPANY 118-124 NORTH CLINTON STREET \* CHICAGO, ILLINOIS

# Over 300 CARBOLOY STANDARDS\* FOR WAR PRODUCTION

#### Standard Stock TOOLS AND BLANKS

Standard stock items are tools and blanks manufactured in mass production, therefore lower priced and more readily available than tools or blanks made to order. Standard tools shown below, in center, can be quickly adapted to meet rush needs by grinding them to special shapes in your tool room.



Two types: (1) carbide tipped (with flat top or back rake) sizes \(\frac{1}{12}\) diameter. (2) solid carbide \(\frac{1}{12}\) through \(\frac{1}{2}\) diameter.

#### Lathe and Grinder Centers

(Up to 50 times longer life than steel. Available as carbide tips only or finished tipped centers. (Morse, B & S, or Jarno tapers.)



#### Standard Carboloy Blanks

For emergency tooling, braze Carboloy blanks to your own shanks. Large selection available.

Style 100 Sizes 51a" to 54" think

Painted Haus Engmer

Scruper

Ammunition Dies



#### General Purpose Standards for Steel, Cast Iron, Etc.

(You quickly grind to hundreds of special shapes. Wide range of sizes)



6 Films Available for Your Plant Training Program

Films show detailed step-by-step procedure on manufacture, design, application and grinding of carbide tools. 35 mm silent slide films (not motion pictures) available at approximate cost of \$20 per set of six.

#### Masonry Drills

Drills concrete, brick, etc., 75% faster than old methods. Use in portable electric drills or hand braces. Speeds up installation of wiring, piping, machinery, etc. Sizes ¼ to 1½°.

#### Diamond-Impregnated Wheel Dressers

Contains large number of sharp diamond particles permanently embedded in carbide matrix. Eliminates remountings. Saves 25% in annual dresser costs. 3 sizes. For all grinding

#### \*Standard-Design Tools

Standard-design tools are former "specials" for which there has been a

large demand within a narrow range of minor design variation. Standardisation now broadly meets most previous requirements. You order by too number: eliminate time for drafting, blueprints, quotations, etc.



GA

43

On Gisholts and W. S. Lather

For cutting off hollow cores such shells.

Greeving Teels Widths over ,060° through ,330°

Sheer Type Tools

Style 12

Style 8

Primarily for interrupted cuts on large forgings or castings.

#### Send for Catalog

32 page catalog No. GT-142 shows full line of standard-stock and standard-design Carboloy Tools. On request.



#### CARBOLOY COMPANY, INC.

Solo makers of the Corboley brand of comented carbides 1114 S. E. B. MILE ROAD, DETROIT, MICH. Bluminghain, Als., Chicago, Carveland, Lea Angeles, Newark, Philadelphia, Pitriburgis, Seattle, Canadian Distributes, Canadian General Electric Company, Ltd., Terosto, Comedia.



TOOLS . DIES . DRESSERS . CORE BITS . MASONRY DRILLS . WEAR RESISTANT PARTS